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ABSTRACT

This is part two of a two-part SMSG elementary school text for third-grade students. The development of mathematical ideas in the text is grounded in appropriate experiences with things from the physical world and the immediate environment. Chapter topics include: (1) addition and subtraction; (2) length and area; (3) multiplication; (4) quotients; (5) division; and (6) rational numbers. (MP)

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STUDENT'S TEXT UNIT NO. 57

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MATHEMATICS FOR THE ELEMENTARY SCHOOL

BOOK 3

PART II

SE 027 898

SCHOOL MATHEMATICS STUDY GROUP

YALE UNIVERSITY PRESS

Mathematics for the Elementary School

Book 3

Student's Text, Part II

REVISED EDITION

Prepared under the supervision of the
Panel on Elementary School Mathematics
of the School Mathematics Study Group:

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Student's Text, Book 3

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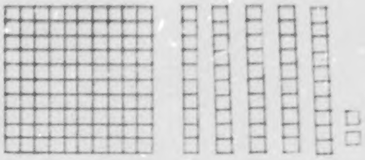
Thinking about Numbers as Tens and Ones

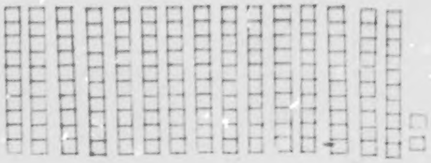
Mary had 152 stamps. She tried arranging them in different ways.

She thought of 152 as:



She wrote 1 hundred 5 tens 2 ones.

Then she thought of 152 as:



She wrote 15 tens 2 ones.

Think of numbers as tens and ones:

Remember: 1 hundred = 10 tens.

186 = _____tens _____ones

782 = _____tens _____ones

200 = _____tens _____ones

420 = _____tens _____ones

345 = _____tens _____ones

700 = _____tens _____ones

727 = _____tens _____ones

129 = _____tens _____ones

504 = _____tens _____ones

870 = _____tens _____ones

317 = _____tens _____ones

603 = _____tens _____ones

499 = _____tens _____ones

890 = _____tens _____ones

Adding a Multiple of Ten

45	45	45	45	45
+10	+20	+30	+40	+50
55	65	75	85	95

23 + 30 = _____

58 + 10 = _____

19 + 40 = _____

47 + 50 = _____

66 + 30 = _____

25 + 70 = _____

55 + 30 = _____

26 + 60 = _____

65 + 30 = _____

55 + 30 = _____

63 +30	26 +20	32 +50
35 +20	35 +40	22 +70
31 +40	33 +40	78 +20
47 +30	52 +40	65 +30
47 +20	85 +10	43 +50
68 +30	74 +20	62 +30
46 +40	24 +70	57 +30

Subtracting a Multiple of Ten

95	95	95	95	95	95
-10	-20	-30	-40	-50	-60
85	75	65	55	45	35

88	77	49
-30	-10	-30
36	85	63
-20	-40	-10
47	95	59
-20	-20	-50
56	74	67
-10	-70	-20
83	97	53
-60	-40	-40
98	86	74
-70	-60	-50
62	81	58
-50	-60	-30

53 - 30 = _____

48 - 10 = _____

59 - 40 = _____

46 - 30 = _____

57 - 10 = _____

40 - 20 = _____

85 - 10 = _____

96 - 20 = _____

75 - 10 = _____

22 - 20 = _____

Adding a Multiple of Ten

237	237	237	237
+10	+20	+30	+40
247	257	267	277

1. Add 10 to each number. Write the sum.

237 556 738 674

2. Add 20 to each number. Write the sum.

656 324 148 437

3. Add 40 to each number. Write the sum.

320 730 130 450

4. **Adding 10**

137 + 10 = _____
103 + 10 = _____
143 + 10 = _____

5. **Adding 20**

137 + 20 = _____
103 + 20 = _____
735 + 20 = _____

Adding Ones, Tens, or Hundreds

$$\begin{array}{r} 147 \\ +\ 2 \\ \hline 149 \end{array} \qquad \begin{array}{r} 147 \\ +\ 20 \\ \hline 167 \end{array} \qquad \begin{array}{r} 147 \\ +\ 200 \\ \hline 347 \end{array}$$

Add the number named at the top of each column to the number named in the left-hand column. Write each sum.

	Add 6	Add 60	Add 600
320	----------	----------	----------
111	----------	----------	----------
332	----------	----------	----------
432	----------	----------	----------

	Add 2	Add 20	Add 200
147	----------	----------	----------
403	----------	----------	----------
637	----------	----------	----------
713	----------	----------	----------

Subtracting a Multiple of Ten or a Hundred

$$\begin{array}{r} 523 \\ -\ 10 \\ \hline 513 \end{array} \qquad \begin{array}{r} 523 \\ -200 \\ \hline 323 \end{array}$$

$$\begin{array}{r} 830 \\ -20 \\ \hline \end{array} \qquad \begin{array}{r} 690 \\ -80 \\ \hline \end{array}$$

$$\begin{array}{r} 564 \\ -\ 30 \\ \hline \end{array} \qquad \begin{array}{r} 759 \\ -40 \\ \hline \end{array}$$

$$\begin{array}{r} 738 \\ -30 \\ \hline \end{array} \qquad \begin{array}{r} 572 \\ -40 \\ \hline \end{array}$$

$$\begin{array}{r} 157 \\ -30 \\ \hline \end{array} \qquad \begin{array}{r} 286 \\ -40 \\ \hline \end{array}$$

$$\begin{array}{r} 482 \\ -50 \\ \hline \end{array} \qquad \begin{array}{r} 389 \\ -300 \\ \hline \end{array}$$

$$\begin{array}{r} 691 \\ -300 \\ \hline \end{array} \qquad \begin{array}{r} 273 \\ -100 \\ \hline \end{array}$$

$$\begin{array}{r} 965 \\ -400 \\ \hline \end{array} \qquad \begin{array}{r} 376 \\ -\ 70 \\ \hline \end{array}$$

214 - 10 = _____

520 - 200 = _____

820 - 300 = _____

754 - 30 = _____

938 - 20 = _____

630 - 400 = _____

750 - 200 = _____

310 - 100 = _____

270 - 40 = _____

590 - 200 = _____

Adding and Subtracting Ones, Tens, Hundreds, and Thousands

Complete each equation.

3 + 4 = _____
30 + 40 = _____
300 + 400 = _____
3000 + 4000 = _____

2 + 6 = _____
20 + 60 = _____
200 + 600 = _____
2000 + 6000 = _____

4 + 5 = _____
40 + 50 = _____
400 + 500 = _____
4000 + 5000 = _____

3 + 5 = _____
30 + 50 = _____
300 + 500 = _____
3000 + 5000 = _____

9 - 5 = _____
90 - 50 = _____
900 - 500 = _____
9000 - 5000 = _____

7 - 3 = _____
70 - 30 = _____
700 - 300 = _____
7000 - 3000 = _____

8 - 3 = _____
80 - 30 = _____
800 - 300 = _____
8000 - 3000 = _____

8 - 6 = _____
80 - 60 = _____
800 - 600 = _____
8000 - 6000 = _____

Differences of One, Ten, or One Hundred.

Show the difference between the numbers:

36 and 46	100	[✓ 10]	1
28 and 29	100	10	[✓ 1]
7 and 17	100	10	1
92 and 82	100	10	1
47 and 57	100	10	1
145 and 135	100	10	1
875 and 775	100	10	1
987 and 986	100	10	1
776 and 766	100	10	1
58 and 68	100	10	1
340 and 440	100	10	1
209 and 210	100	10	1
487 and 477	100	10	1
509 and 609	100	10	1
301 and 311	100	10	1

Adding and Subtracting Multiples of Ten and a Hundred

Use either > (greater than), or < (less than) in each box to make the sentence true.

40 + 50 ☐ 100

159 + 40 ☐ 200

33 + 50 ☐ 100

90 + 97 ☐ 200

18 + 30 ☐ 50

556 + 400 ☐ 1000

25 + 70 ☐ 100

299 + 200 ☐ 400

421 + 80 ☐ 500

600 + 500 ☐ 1000

556 + 400 ☐ 900

900 - 700 ☐ 100

85 - 70 ☐ 20

59 - 40 ☐ 10

46 - 20 ☐ 20

78 - 30 ☐ 50

156 - 40 ☐ 100

790 - 80 ☐ 700

44 - 30 ☐ 10

59 - 40 ☐ 20

665 - 60 ☐ 600

432 - 50 ☐ 400

Patterns

Find the pattern

1) 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
What is the pattern? ______________________________

2) 25, 22, 19, 16, 13, 10, 7, 4, 1
What is the pattern? ______________________________

3) 70, 63, 56, 49, 42, 35, 28, 21, 14, 7, 0
What is the pattern? ______________________________

4) 9, 18, 27, 36, 45, 54, 63, 72, 81, 90
What is the pattern? ______________________________

5) 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17
What is the pattern? ______________________________

6) 2, 9, 7, 14, 12, 19, 17, 24, 22, 19, 27
What is the pattern? ______________________________

7) 10, 8, 13, 11, 16, 14, 19, 17, 22, 10, 25
What is the pattern? ______________________________

8) 79, 83, 76, 80, 63, 67, 60, 64, 57
What is the pattern? ______________________________

More about Patterns

Each list of numbers below has a pattern.

Can you tell what it is?

Fill in the blanks using this pattern.

(a) 210, 230, 250, 270, _____, _____

What is the pattern? ____________________________

(b) 67, 57, 47, 37, _____, _____

What is the pattern? ____________________________

(c) 606, 636, 666, _____, _____

What is the pattern? ____________________________

(d) 900, 850, 800, 750, _____, _____

What is the pattern? ____________________________

(e) 253, 353, 453, _____, _____

What is the pattern? ____________________________

(f) 782, 762, 742, _____, _____

What is the pattern? ____________________________

(g) 347, 447, 547, _____, _____

What is the pattern? ____________________________

(h) 993, 963, 933, _____, _____

What is the pattern? ____________________________

Addition: Renaming Ten Ones as One Ten

Use the form which is best for you.

39 + 27 = -----

45 + 28 = -----

56 + 38 = -----

66 + 29 = -----

42 + 49 = -----

38 + 27 = -----

37 + 26 = -----

35 + 47 = -----

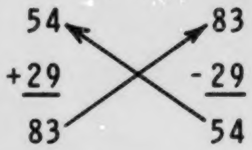
19 + 21 = -----

Subtraction: Renaming One Ten as Ten Ones

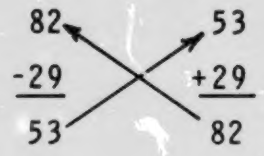
Use the form that is best for you.

80 - 47 = _____	65 - 28 = _____	52 - 35 = ____
73 - 26 = _____	44 - 17 = _____	86 - 79 = ____
61 - 34 = _____	87 - 29 = _____	38 - 19 = ____

Using Doing and Undoing

Check these examples.	
 54 +29 83 83 -29 54	46 +27 73
38 +59 97	27 +54 81
78 +16 94	66 + 29 95
54 +38 92	46 +24 80
43 +47 90	28 +43 71

Using Doing and Undoing

Check these examples.	
	$\begin{array}{r}42\\-17\\\hline 25\end{array}$
$\begin{array}{r}74\\-38\\\hline 36\end{array}$	$\begin{array}{r}57\\-29\\\hline 28\end{array}$
$\begin{array}{r}96\\-59\\\hline 37\end{array}$	$\begin{array}{r}85\\-26\\\hline 69\end{array}$
$\begin{array}{r}93\\-28\\\hline 65\end{array}$	$\begin{array}{r}65\\-28\\\hline 37\end{array}$
$\begin{array}{r}41\\-27\\\hline 14\end{array}$	$\begin{array}{r}77\\-28\\\hline 49\end{array}$

Using Doing and Undoing

Use the form which is best for you. Check your answers.

79 + 86 = _____	84 + 57 = _____	61 + 89 = ____
95 + 37 = _____	86 + 87 = _____	54 + 65 = ____
46 + 95 = _____	59 + 75 = _____	32 + 79 = ____

Using Doing and Undoing

Use the form which is best for you. Check your answers.

284 + 395 = ____	364 + 275 = ____	582 + 377 = ____
473 + 435 = ____	650 + 250 = ____	625 + 284 = ____
360 + 279 = ____	234 + 592 = ____	767 + 142 = ____

Using Doing and Undoing

Compute. Check your answers.

268 - 194 = _____

309 - 135 = _____

537 - 283 = ____

739 - 356 = _____

826 - 472 = _____

905 - 653 = ____

849 - 295 = _____

737 - 584 = _____

606 - 274 = ____

Using Doing and Undoing

Compute. Check your answers.

482 -25	158 -93	407 + 517
461 +38	796 - 238	561 + 328
237 -162	709 + 226	492 - 233

Using Doing and Undoing

Compute. Check your answers.

46 +99	98 -39	178 - 83
561 -233	87 +38	573 +428
725 -392	81 -27	635 +219

Computing the Sum of Three Numbers

3 + 6 + 5 = _____   8 + 6 + 5 = _____

2 + 9 + 6 = _____   5 + 7 + 4 = _____

5 + 6 + 4 = _____   3 + 4 + 9 = _____

7	5	6	9	8	3
2	3	5	4	7	8
8	7	7	5	4	6

1	2	8	6	4	9
7	7	9	3	3	5
9	8	2	5	9	5

4	5	7	9	1	6
9	6	3	8	8	8
4	8	9	2	9	5

3	4	5	7	9	8
8	8	9	5	6	5
5	6	4	7	3	4

Using Basic Facts

4 + 3 = _____
14 + 3 = _____
24 + 3 = _____
34 + 3 = _____

7 + 8 = _____
17 + 8 = _____
27 + 8 = _____
37 + 8 = _____

4 + 7 = _____
14 + 7 = _____
44 + 7 = _____
34 + 7 = _____

6 + 9 = _____
16 + 9 = _____
56 + 9 = _____
36 + 9 = _____

4 + 8 = _____
14 + 8 = _____
44 + 8 = _____
24 + 8 = _____

5 + 9 = _____
25 + 9 = _____
15 + 9 = _____
35 + 9 = _____

2 + 6 = _____
12 + 6 = _____
52 + 6 = _____
22 + 6 = _____

8 + 8 = _____
48 + 8 = _____
28 + 8 = _____
68 + 8 = _____

3 + 9 = _____
23 + 9 = _____
63 + 9 = _____
13 + 9 = _____

Find the sums

8	5	8	5	9	7
9	9	8	7	7	7
+8	7	9	6	9	7

6	9	9	7	5	6
8	5	8	9	7	9
+8	7	5	9	6	9

Using Basic Facts

5 + 7 = _____
25 + 7 = _____
15 + 7 = _____

3 + 5 = _____
13 + 5 = _____
33 + 5 = _____

6 + 8 = _____
36 + 8 = _____
16 + 8 = _____

2 + 9 = _____
12 + 9 = _____
32 + 9 = _____

6 + 7 = _____
46 + 7 = _____
16 + 7 = _____

4 + 5 = _____
14 + 5 = _____
24 + 5 = _____

8 + 4 = _____
28 + 4 = _____
18 + 4 = _____

5 + 8 = _____
35 + 8 = _____
15 + 8 = _____

7 + 9 = _____
27 + 9 = _____
17 + 9 = _____

Find the sums.

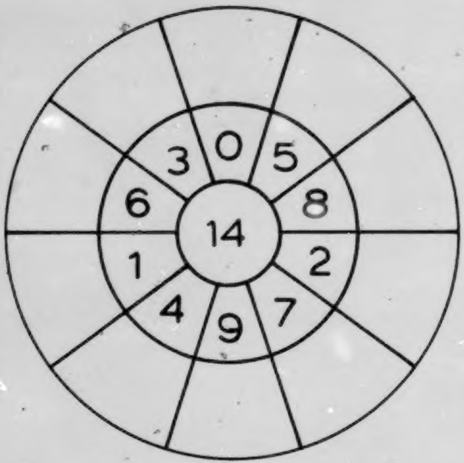
6	7	9	8	9	5
7	8	9	7	7	7
5	8	4	7	8	9

8	5	6	8	7	9
8	8	6	8	7	8
7	5	9	8	5	9

Reviewing Basic Facts

To the number named in the center, add each number named in the second ring.

Write their sum in the outer ring.


3
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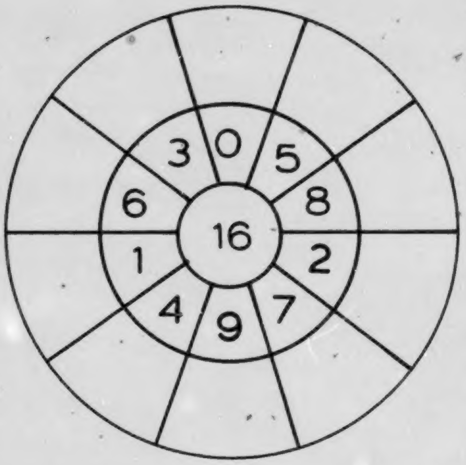
5
6
8
14
1
2
4
9
7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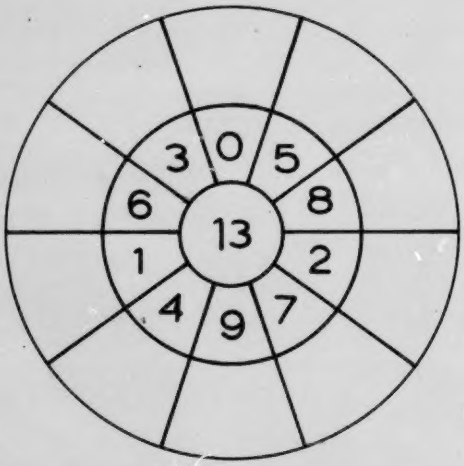
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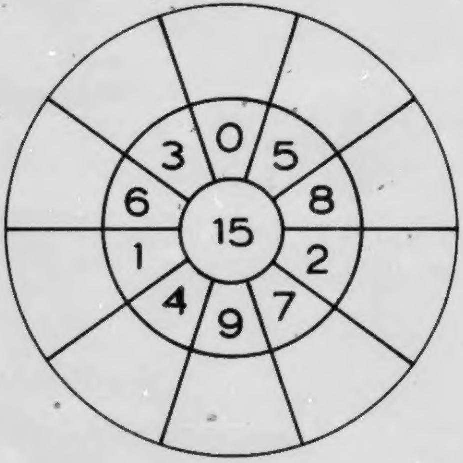

3
0
5
6
8
15
1
2
4
9
7

Computing the Sum of Three Numbers

If you have to use a longer form, write these examples on another paper.

36 21 32	45 24 30	16 72 11	45 12 32
84 10 5	26 43 30	43 12 44	73 5 21
4 63 22	51 26 12	66 10 23	34 21 44
25 42 32	13 64 22	67 12 20	35 13 41
73 15 11	12 54 32	24 22 33	61 23 12

Computing the Sum of Three Numbers

86 75 24	45 27 96	79 15 65	57 79 22
27 22 46	64 75 27	18 46 23	25 49 17
48 67 24	59 74 56	27 97 45	63 89 44
41 79 98	58 99 78	78 58 88	86 56 66

Computing the Sum of Three Numbers

68 18 59	46 18 69	37 16 99	25 88 68
17 48 96	25 59 89	59 98 87	14 99 40
67 47 68	56 29 89	45 98 79	32 99 88
13 99 75	84 97 96	39 75 79	58 96 77

Computing Sums

Find the sum of 497 and 353. Use the form which is best for you.

$$\begin{array}{r} 400 + 90 + 7 \\ \underline{300 + 50 + 3} \\ 700 + 140 + 10 = 850 \end{array} \qquad \begin{array}{r} 497 \\ \underline{+353} \\ 10 \\ 140 \\ \underline{700} \\ 850 \end{array} \qquad \begin{array}{r} 497 \\ \underline{353} \\ 850 \end{array}$$

587 + 267 = _____

$$\begin{array}{r} 587 \\ \underline{267} \end{array}$$

338 + 379 = _____

$$\begin{array}{r} 338 \\ \underline{379} \end{array}$$

468 + 85 = ___

$$\begin{array}{r} 468 \\ \underline{85} \end{array}$$

287 + 486 = _____

$$\begin{array}{r} 287 \\ \underline{486} \end{array}$$

653 + 298 = _____

$$\begin{array}{r} 653 \\ \underline{298} \end{array}$$

447 + 379 = __

$$\begin{array}{r} 447 \\ \underline{379} \end{array}$$

526 + 298 = _____

$$\begin{array}{r} 526 \\ \underline{298} \end{array}$$

437 + 78 = _____

$$\begin{array}{r} 437 \\ \underline{78} \end{array}$$

383 + 598 = __

$$\begin{array}{r} 383 \\ \underline{598} \end{array}$$

Computing Sums

964 + 89 = ----- $\begin{array}{r} 964 \\ \underline{89} \end{array}$	178 + 785 = ----- $\begin{array}{r} 178 \\ \underline{785} \end{array}$
457 + 388 = ----- $\begin{array}{r} 457 \\ \underline{388} \end{array}$	169 + 765 = ----- $\begin{array}{r} 169 \\ \underline{765} \end{array}$
654 + 297 = ----- $\begin{array}{r} 654 \\ \underline{297} \end{array}$	586 + 378 = ----- $\begin{array}{r} 586 \\ \underline{378} \end{array}$
264 + 579 = ----- $\begin{array}{r} 264 \\ \underline{579} \end{array}$	736 + 197 = ----- $\begin{array}{r} 736 \\ \underline{197} \end{array}$

Computing Sums

264 + 579 = _____

736 + 197 = _____

654 + 297 = _____

586 + 278 = _____

964 + 89 = _____

178 + 785 = _____

457 + 388 = _____

169 + 765 = _____

Computing Sums

343 +379	154 + 767
316 + 594	899 + 21
245 +487	487 +397
568 + 258	654 + 279

Computing Sums

148 +594	727 +688
546 +356	225 +599
676 +279	388 +167
368 +599	479 +187

Computing Sums

346 +475	347 +453
349 +499	561 +299
492 +369	389 +148
344 +297	476 +224

Computing Sums

(1) 638 + 393 = _____

(2) 859 + 584 = _____

(3) 747 + 679 = _____

(4) 635 + 779 = _____

(5) 235 + 898 = _____

(6) 999 + 341 = _____

(7) 766 + 398 = _____

(8) 726 + 775 = _____

(9) 984 + 16 = _____

(10) 585 + 656 = _____

(11) 737 + 287 = _____

(12) 539 + 898 = _____

(13) 632 + 989 = _____

(14) 726 + 787 = _____

(15) 315 + 697 = _____

(16) 834 + 476 = _____

(17) 347 + 653 = _____

(18) 234 + 277 = _____

(19) 564 + 236 = _____

(20) 298 + 345 = _____

(21) 325 + 297 = _____

(22) 248 + 398 = _____

(23) 576 + 297 = _____

(24) 469 + 331 = _____

(25) 345 + 287 = _____

(26) 573 + 198 = _____

(27) 455 + 555 = _____

(28) 423 + 298 = _____

(29) 827 + 173 = _____

(30) 769 + 199 = _____

Order Relations

Use the symbol < (less than) or > (greater than).

35 + 63 ☐ 100

485 + 314 ☐ 800

500 + 600 ☐ 1000

86 + 97 ☐ 200

54 + 55 ☐ 100

300 + 263 ☐ 500

499 + 99 ☐ 600

54 + 26 ☐ 70

437 + 463 ☐ 1000

160 + 395 ☐ 500

200 + 341 ☐ 500

555 + 461 ☐ 1000

37 + 67 ☐ 100

297 + 312 ☐ 600

144 + 50 ☐ 200

Computing Sums

6483 +1279	3688 +2285	4479 +5396
3327 +6599	7248 +2476	1532 + 6289
2448 + 469	3446 + 6377	3584 + 4278

Computing Sums

278 434 276	385 287 153	446 337 144	639 128 193
166 399 415	372 584 21	600 37 288	392 303 205
343 167 472	666 118 75	747 89 155	259 496 225
456 125 397	247 198 457	483 257 169	578 65 265

A Cross-Number Puzzle

1	2	3	▨	▨	4	5	6
7		▨	8	9	▨	10	
	▨	11			12	▨	
▨	13		▨	▨	14	15	▨
▨	16		▨	▨	17		▨
18	▨	19	20	21		▨	22
23		▨	24		▨	25	

Across

1. Three hundred eighty-five
4. Another way to write 500 + 30 + 9
7. 1 more than 3 tens and 10 ones.
8. 8 + 8 + 8 + 2
10. (60 + 3) + 3 + 3
11. 46 hundreds and 17 ones
13. 31 - 10
14. 9 + 9 + 9
16. 630 - 600
17. ____ is 12 more than 70.
19. 3000 + 500 + 60 + 9
23. 539 = ____ tens + 19 ones
24. Months in a year
25. 26 - 9

Down

1. 34 tens
2. ____ < 82
5. 556 - 520
6. Largest number less than 1000.

Down

?

8. 2 tens and 6 ones

? 9. 33 + 28

11. Four thousand one hundred three

12. 4289, 5289, 6289, ________

13. 1 ten and 13 ones

15. 720 equals how many tens?

18. 3 fives

20. 70 - 19

21. 5 tens and 12 ones

22. 7, 12, 17, 22, ______

Computing Differences

532 -275	983 -271
816 -387	614 -389
721 -289	435 -263
945 -467	736 -449

Computing Differences

825 -376	254 -189
334 -167	513 -286
622 -235	324 - 58
461 -378	671 -298

Computing Differences

651 - 287 = _____

653 - 296 = _____

427 - 269 = _____

514 - 395 = _____

821 - 367 = _____

336 - 278 = _____

745 - 479 = _____

534 - 298 = _____

Using Renaming with Subtraction

1) 400 = 40 tens
400 = 39 tens 10 ones
400 = ________ + ________

$$\begin{array}{r} 400 \\ -187 \\ \hline 213 \end{array}$$

2) 500 = ________ tens
500 = ________ tens 10 ones
500 = ________ + ________

$$\begin{array}{r} 500 \\ -132 \\ \hline \end{array}$$

3) 600 = ________ tens
600 = ________ tens 10 ones
600 = ________ + ________

$$\begin{array}{r} 600 \\ -249 \\ \hline \end{array}$$

4) 700 = ________ tens
700 = ________ tens 10 ones
700 = ________ + ________

$$\begin{array}{r} 700 \\ -297 \\ \hline \end{array}$$

5) 800 = ________ tens
800 = ________ tens 10 ones
800 = ________ + ________

$$\begin{array}{r} 800 \\ -256 \\ \hline \end{array}$$

6) 900 = ________ tens
900 = ________ tens 10 ones
900 = ________ + ________

$$\begin{array}{r} 900 \\ -776 \\ \hline \end{array}$$

Computing Differences

600 -351	904 -498
305 - 68	703 -265
900 -321	804 -475
702 -376	603 -247

Computing Differences

784 -292	386 - 99
304 -291	801 -794
764 -198	368 -129
430 -109	800 -298

Order Relations

Write > or < in the box.

400 - 299 ☐ 100

700 - 304 ☐ 400

500 - 201 ☐ 300

200 - 98 ☐ 100

3286 - 200 ☐ 3000

6457 - 387 ☐ 6000

684 - 80 ☐ 600

500 - 267 ☐ 300

700 - 302 ☐ 400

1000 - 506 ☐ 500

Using Renaming with Subtraction

1) 7000 = ________ tens
7000 = ________ tens 10 ones
7000 = 6990 + 10

7000
-2689
4311

2) 5000 = ________ tens
5000 = ________ tens 10 ones
5000 = ________ + ________

5000
-1234

3) 2002 = ________ tens ________ ones
2002 = ________ tens 12 ones
2002 = ________ + ________

2002
-1679

4) 6008 = ________ tens ________ ones
6008 = ________ tens 18 ones
6008 = ________ + ________

6008
-2659

5) 4010 = ________ tens ________ ones
4010 = ________ tens 10 ones
4010 = ________ + ________

4010
-2605

6) 9075 = ________ tens ________ ones
9075 = ________ tens 15 ones
9075 = ________ + ________

9075
-2066

Computing Differences

6400 -2209	8008 -2439
7034 -1027	7041 -2039
6481 -2276	6005 -1896
9800 -2709	3980 -1777

Computing Differences

5721 -2317	8105 -1099
8407 -2308	1827 - 318
5776 -2149	3987 -1259
3605 -2176	9002 -2345

Computing Differences

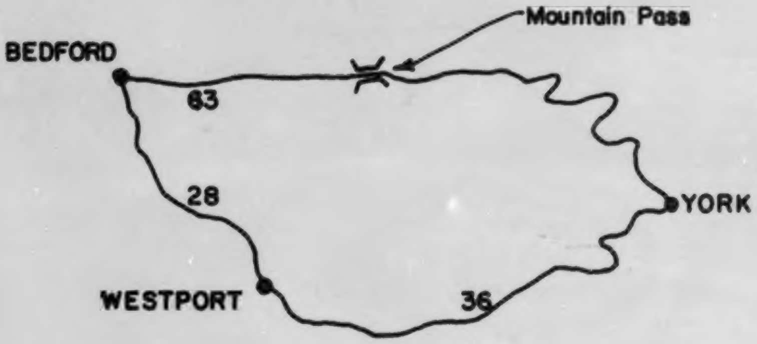
5721 -2598	7814 -3675
9445 -6258	8652 -5387
3268 -1752	7624 -3378
5816 -1749	3730 -2395

Computing Differences

6323 -1278	6401 -2389
4727 -3193	8254 -2128
6845 -2376	7641 -2238
4302 -2164	5728 -1219

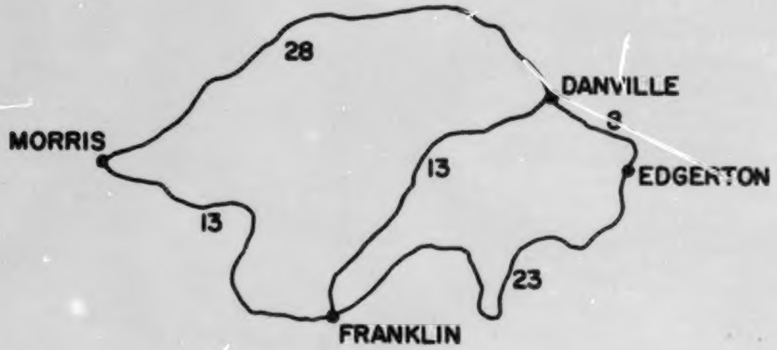
☆ Road maps

1. Here is a road map. The numbers on the roads show distances in miles.


Mountain Pass
BEDFORD
63
28
YORK
WESTPORT
36

Which is the shorter route from Bedford to York? Via Westport or over the pass? ______________________

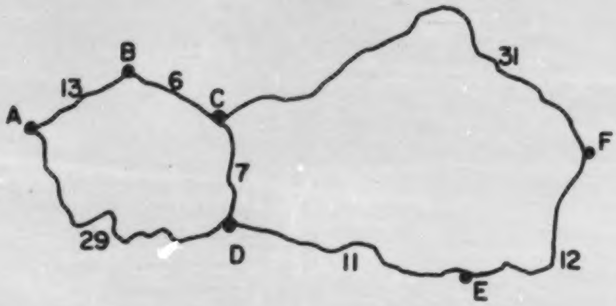
2. Here is another road map.


28
DANVILLE
8
MORRIS
13
EDGERTON
13
23
FRANKLIN

What is the shortest route from Morris to Edgerton?

____

3. What is the shortest route from A to F? ____________________


A
B
C
D
E
F
13
6
7
29
11
31
12

How many routes are there from A to F? ________ One of them is A B C F. List all the others.

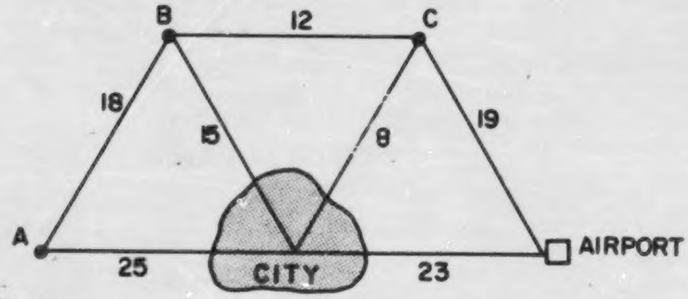
____

____

____

Did you check all of these in order to find which one is shortest?

4. Here is a map of a city with some nearby towns and the airport. The numbers show how long it takes in minutes to drive from one place to another:


B
12
C
18
15
8
19
A
25
CITY
23
AIRPORT

What is the quickest way to get from town A to the airport?

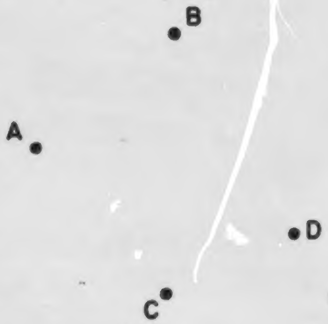
____

5. Here is a chart showing the distances by direct road between towns A, B, C, D. For example, the distance between A and B is 30 miles. No number was put in the A, D square because there is no direct road from A to D.

	A	B	C	D
A	0	30	60	▨
B	30	0	20	40
C	60	20	0	10
D	▨	40	10	0

Find the shortest route from A to D. ____________________

Can you draw a map to help you? Here are the towns A, B, C, D:



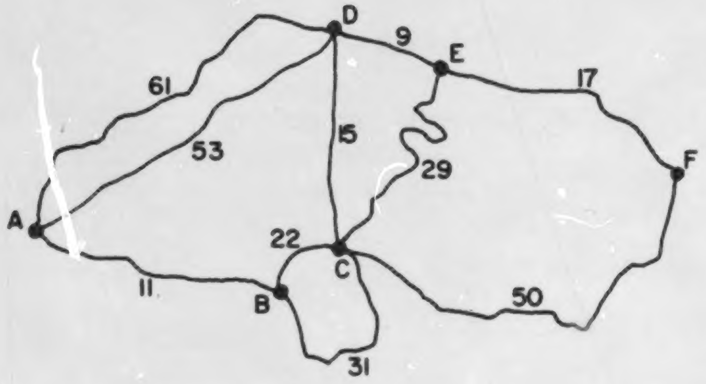
The road from A to C cannot be straight. Why? ____________

____

____

____

6. Here is a more complicated map. There are 14 ways to get from A to F. Can you find the shortest way without looking at all 14 ways separately? The questions below will help you.



(1) How far is it from A to C by the shortest route? ____________

(2) How far is it from A to D by the shortest route? (Your answer to question 1 will help you.) ____________

(3) How far is it from A to E by the shortest route? (Your answers to questions 1 and 2 will help you.) ____________

(4) How far is it from A to F by the shortest route? (Your answers to questions 1 and 3 will help you.) ____________

* Subtraction by Complementation

In these problems we are going to play with equations a little bit and then, using equations, we will find a new way to do subtraction.

1. Is this equation correct? ____________

$$7 + 8 = 9 + 6$$

Now we add the same number to both sides:

$$7 + 8 + 4 = 9 + 6 + 4$$

Is the equation still correct? ____________

2. Is this equation correct ? ____________

$$12 + 7 = 10 + 9$$

Now we subtract the same number from both sides:

$$12 + 7 - 8 = 10 + 9 - 8$$

Is the equation still correct? ____________

If you add the same number to both sides of a correct equation, the equation remains correct.

If you subtract the same number from both sides of a correct equation, the equation remains correct.

3. Let's check these rules with some more examples. Do the arithmetic on each side of the equation and put the answer in the blank below.

$$8 + 3 = 15 - 4$$

____ = ____

Are the two sides the same? _______ Now add 9 to both sides:

$$8 + 3 + 9 = 15 - 4 + 9$$

____ = ____

Are the two sides still the same? ________ Now try these:

$$12 + 16 = 13 + 15$$

____ = ____

Add 7 to both sides:

$$12 + 16 + 7 = 13 + 7 + 15$$

_____ = _____

Notice where we put the 7 on the right side. Does it make any difference where we put it? _________

Now try these:

$$10 + 10 = 13 + 7$$

_____ = _____

Subtract 3 from both sides:

$$10 + 10 - 3 = 13 - 3 + 7$$

_____ = ______

$$45 + 62 = 100 + 7$$

_____ = _____

Subtract 5 from both sides:

$$45 - 5 + 62 = 100 + 7 - 5$$

_____ = _____

$$137 - 18 = 100 + 19$$

_____ = _____

Subtract 100 from both sides:

$$137 - 100 - 18 = 100 - 100 + 19$$

_____ = _____

4. Which of these equation are correct? Use the rules you learned in problems 1 and 2 above.

$9 + 8 = 17$ correct? __________

$9 + 8 + 372 = 17 + 372$ correct? __________

$14 + 9 + 8 = 17 + 14$ correct? __________

$9 + 523 + 8 = 523 + 17$ correct? __________

$47 + 18 = 13 + 50$ correct? __________

$47 + 18 - 28 = 13 + 50 - 28$ correct? __________

$55 = 25 + 30$ correct? __________

$55 + 100 - 100 = 25 + 30$ correct? __________

5. Fill in the blanks:

0 + ____ = 9
1 + ____ = 9
2 + ____ = 9
3 + ____ = 9
4 + ____ = 9

5 + ____ = 9
6 + ____ = 9
7 + ____ = 9
8 + ____ = 9
9 + ____ = 9

The numbers you have just written are called the nine's complements of 1, 2, 3, 4, 5, 6, 7, 8, 9. "Complement" is a word you will be seeing in mathematics. It means "the piece left over". We call 2 the nine's complement of 7 because 2 is the "piece" left over after you subtract 7 from 9. The word "complement" is related to the word "complete." It has nothing to do with "compliment". What does compliment mean?

6. Do these subtractions:

$$\begin{array}{r} 9 \\ \underline{-7} \end{array} \qquad \begin{array}{r} 99 \\ \underline{-38} \end{array} \qquad \begin{array}{r} 999 \\ \underline{-506} \end{array} \qquad \begin{array}{r} 9999 \\ \underline{-2914} \end{array}$$

If you know the nine's complements, subtracting numbers from 9 or 99 or 999, etc., is easy. Tell here how to do it:

____

____

____

7. 9 + 1 = ____

99 + 1 = ____

999 + 1 = ____

9999 + 1 = ____

8. Are these equations correct? ________

1000 - 478 = 999 + 1 - 478

1000 - 478 = 999 - 478 + 1

9. Do these:

999 - 328 = ________

1 + 999 - 328 = ________

1000 - 328 = ________

1000 - 479 = ________

1000 - 165 = ________

10000000 - 4671023 = ________

If you know the nine's complements, subtracting numbers from 10 or 100 or 1000, etc., is easy. Tell here how to do it.

____

____

10. Subtracting 10, 100, 1000, etc., from other numbers is easy, too. Do these:

184 - 100 = ________

1436 - 1000 = ________

2048 - 1000 = ________

11. Is this equation correct? ________

$$723 - 489 = 723 - 489 + 1000 - 1000$$

Let's change the order of the terms on the right.

$$723 - 489 = 1000 - 489 + 723 - 1000$$

Is the equation still correct? ________

Now we will use this equation to help us to do the subtraction

$$723 - 489$$

Let's do the right side of the equation:

$$1000 - 489 = \underline{\qquad\qquad}$$

$$1000 - 489 + 723 = \underline{\qquad\qquad}$$

$$1000 - 489 + 723 - 1000 = \underline{\qquad\qquad}$$

Now do the subtraction the usual way.

$$\begin{array}{r} 723 \\ -\ \underline{489} \end{array}$$

Did you get the same answer? ________

12. Here are two ways to do this subtraction:

523 - 297

New way:

1000 - 297 = _________

Add 523 to what you just got. _________

Subtract 1000 from what you just got. _________

Old way:

$$\begin{array}{r}523\\ -\underline{297}\end{array}$$

Did you get the same answer? _________

13. Do these subtractions:

New way:

1000 - 387 = _________

Add 615: _________

Subtract 1000: _________

1000 - 195 = _________

Add 263: _________

Subtract 1000: _________

Old way:

$$\begin{array}{r}615\\ -\underline{387}\end{array}$$

$$\begin{array}{r}263\\ -\underline{195}\end{array}$$

Explain why the new way works. _________________________________

____

____

Solving Problems

Write an equation and an answer sentence.

1. During a lesson about Indians, Kevin learned that one chief lived to be 94 years old. He thought that in 85 years he would be that old. What is Kevin's age now?

   ____

   ____

2. Julie's family went on a boat trip. They traveled 68 miles to an island and 75 miles back to the harbor. How many miles did they travel during the whole trip?

   ____

   ____

3. A basketball was on sale for 79¢. Some children wanted to buy it. They had 95¢. How much money would they have left after buying the ball?

   ____

   ____

4. Mr. Ford has 32 pills in his medicine bottle. If he had 40 pills when he bought the medicine, how many pills has he used so far?

____

____

5. There were 95 boys on the playground. 47 of them were playing on the equipment. How many boys were doing something else?

____

____

6. Susan needs 97 cents to buy a doll. She has 36 cents. How much more money does she need?

______ ______________________

____

Set 5

Solving Problems

Write an equation and an answer sentence.

1. Jack's small turtle is 26 years old. His large turtle is 65 years old. How much older is the large turtle?

2. Saturday Mary went to visit her cousin. She went 183 miles on the train. She rode 32 miles from the train station to her cousin's house. How far did Mary ride on her way to her cousin's house?

3. Last year Mary went on a 675-mile trip. How much further did she travel last year than she did on the trip to her cousin's house?

4. Mr. Smith had 573 bricks to make a walk. He had 28 left when the walk was finished. How many bricks did he use?

____

____

5. Sally counted her steps to school. She went 73 steps to the corner and 28 more to the school yard. How many steps did she take from her house to the school yard?

____

____

Set 6

Solving Problems

Write an equation and complete the answer sentence for each problem.

1. During the annual Campfire Girls' candy sale, Mary's team sold 232 boxes of mints. Sue's team sold 472 boxes of mints. Find the total number of boxes sold by the teams of the two girls.

   ____

   They sold _________ boxes.

2. The pupils of Oak School collected gifts for other children at Christmas. They collected 133 books and 316 toys. How many gifts were collected?

   ____

   _________ gifts were collected.

3. John is 55 inches tall. His father is 74 inches tall. How many inches must John grow to be as tall as his father?

   ____

   John must grow _________ inches.

4. Sue has $25 to buy a bicycle. The bicycle costs $42. How much more money must she save?

   ____

   Sue must save __________.

5. A high school stadium has 700 seats. 462 tickets have been sold for a game. How many tickets are left?

____

_____ tickets are left.

6. A bear in a zoo weighs 746 pounds. A seal weighs 572 pounds. How much less does the seal weigh than the bear?

____

The seal weighs ______ pounds less than the bear.

7. Billy has 48 marbles. Tom has 52. How many more marbles does Tom have than Billy?

____

Tom has _______ more marbles than Billy.

8. Write the equation and the answer sentence.

Jimmy had 267 toy cars. If he gave away 82 cars, how many cars would he have then?

____

____

Set 7

Solving Problems

Write an equation and the answer sentence.

1. Miss Lane has 200 erasers. She has 34 children in her class. If she gives one eraser to each child in her class, how many erasers does she still have?

   ____

   ____

2. The third and fourth grades were going on a field trip. There were 113 children in all. There were 57 children in the fourth grade classes. How many children were in the third grade classes?

   ____

   ____

3. Mr. Williamson needs 100 gallons of paint to paint his motel. He has 11 gallons. How many more gallons does he need?

   ____

   ____

4. Michael has 75¢. He wanted to buy a book for 90¢. How much more money does he need?

____

____

5. During the Wheeler family's first trip they wrote 77 post cards. On their next trip they wrote 39 post cards. How many post cards did they write on both trips?

____

____

6. There were 23 apples in a basket. Eighteen of the apples were eaten. How many apples were still left in the basket?

____

____

Set 8

Write an equation and complete the answer sentence.

1. There are 298 children in school. If 176 of them are girls, how many of them are boys?

   ____

   There are __________ boys.

2. Nan has 13 dolls. Polly has 17 dolls. Beatrice has 9 dolls. How many dolls do the girls have?

   ____

   The girls have __________ dolls.

3. One day there were 98 boats on the river. The next day, after a storm, there were only 37. How many boats were missing on the second day?

   ____

   __________ boats were missing.

4. Thirty-one children were invited to Mary's birthday party. Twenty-six came. How many children did not come?

   ____

   __________ children did not come.

5. A museum had 372 pictures. Some were stolen. If 297 pictures were left, how many were stolen?

____

____________pictures were stolen.

6. In the library there were 213 books. Some new books were given to the library. Then the library had 300 books. How many books were given to the library?

____

____________books were given to the library.

7. There were 230 animals in the zoo. One hundred seventy-five of them were dangerous. How many of them were not?

____

____________animals were not dangerous.

8. One hundred seventy-two rockets had been sent off. Then 111 more were sent off. How many rockets were fired?

____

____________ rockets were fired.

Set 9

Solving Problems

Write an equation and an answer sentence.

1. The corner drug store had 987 ball-point pens in stock. They sold 14 of them. How many do they have now?

   ____

   ____

2. Mrs. Foster had a lot with 540 peach trees. She bought another lot with 230 more peach trees. How many peach trees does she have now?

   ____

   ____

3. The Lincoln School has a total of 957 children. If 28 of them are in Mrs. Hoff's class, how many are in the rest of the school?

   ____

   ____

4. Claudia is collecting stamps. She has 969 stamps in all. Of these, 702 are not American stamps. How many of them are American stamps?

____

____

5. Alfred is reading a book that has 234 pages. He has to read another 41 pages before he finishes the book. How many pages has he read?

____

____

6. Girl Scout Troop 66 sold 596 boxes of cookies. Troop 72 sold only 339 boxes. How many boxes did both of the troops sell?

____

____

7. The boys collected 436 pounds of paper for the school paper drive. The girls collected 509 pounds. How many pounds of paper did the boys and girls collect?

____

____

8. John went to the store with 45 cents. He bought a ball for 33 cents. How much money did he have then?

____

____

9. Carol put 15 candles on Mother's cake. Mother laughed and said, "Carol, you know I am forty-three years old!" How many more candles should be on Mother's cake?

____

____

Set 10

Solving Problems

Use your own paper. First, write the number of the problem. Next, write an equation. Last, write a sentence which tells the answer to the problem.

1. The 14 Brownies of Mrs. Lake's group invited the 18 Brownies of Mrs. Webster's group to go on a picnic with them. How many Brownies would be going to the picnic if everyone could go?

2. Sixteen boys from the Center School are in the Little League baseball team. Twenty-three boys from the West School are members. How many more boys from the West School than the Center School are members of the Little League?

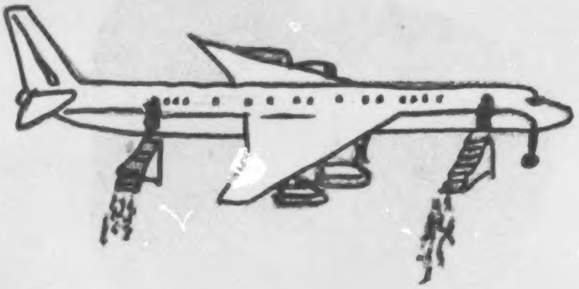
3. If 535 cartons of milk were bought by the school lunchroom on Monday, and 458 cartons were bought on Tuesday, how many were bought both days?

4. If 415 of these cartons were chocolate milk, how many were regular milk?

5. Barbara has a collection of buttons. Penny brings her collection of 180 buttons over to Barbara's house. The girls count the buttons and find there are 321 all together. "Oh," said Barbara, "I forgot to count mine!" How many buttons did Barbara have?

Set 11

Solving Problems



A Visit to the Airport

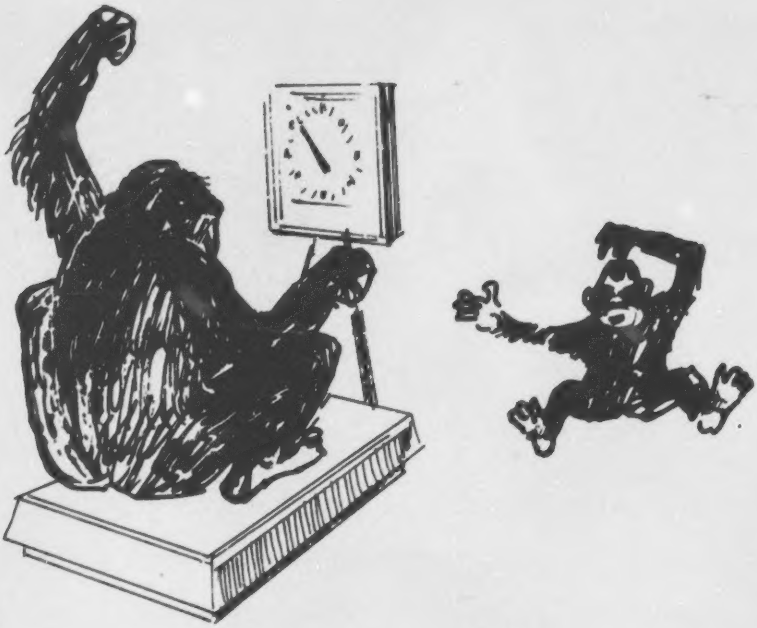
Follow the directions for Set 10.

1. Paula and John went to the airport with their parents. Paula counted 33 passengers entering at the front of a jet. John counted 82 passengers entering at the back. How many passengers did they count?

2. One hundred seventy-six pieces of baggage were piled on several trucks. One of these trucks pulled away with 39 pieces of baggage. How many were on the other trucks?

3. Paula and John looked around on the observation platform and counted 37 people including themselves. If 16 of the people were children, how many adults were there?

4. A jet landed and the pilot said he had 432 more miles to go. If the total trip he makes is 906 miles, how far had he already gone?



At the Zoo

Write your answers to these questions.

Betty and Jim are at the zoo. The zoo keeper wanted to weigh a baby gorilla, but the baby gorilla would not stay on the scale. The zoo keeper solved the problem by weighing the mother gorilla first. She weighed 162 pounds. Then he weighed the mother gorilla holding the baby gorilla in her arms. Together they weighed 190 pounds. How could the zoo keeper know what the baby gorilla's weight was?

Jim said he was going to give his bag of 75 peanuts to the gorillas. If they ate 27, how many were not eaten?

Set 12

Solving Problems

Write an equation and an answer sentence for each problem.

1. Father had 22 tulip bulbs to plant. He found that 6 of them were not good and he threw them away. He bought a dozen more tulip bulbs at a sale. How many bulbs did he have then?

____

____

____

2. Jim had 15 glass marbles and 13 steel marbles. He gave 12 of his marbles to Sam. How many marbles did Jim have then?

____

____

____

3. Sue had 11 pieces of dollhouse furniture and Jackie had 13 pieces of doll furniture. While they were playing together they broke 4 of the chairs. How many pieces of doll furniture did they have then?

____

____

____

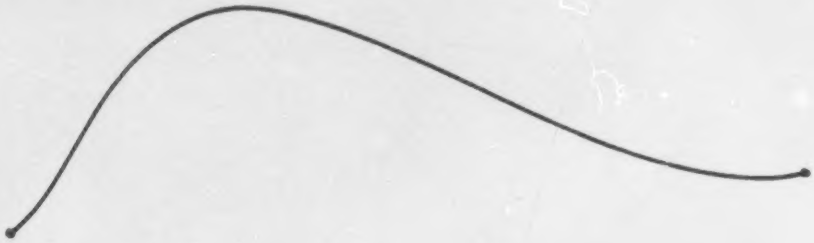
4. Mother baked 24 chocolate cupcakes and 18 white cupcakes. She sent 10 of the chocolate cupcakes to Grandmother. How many cupcakes does Mother have now?

5. Mr. Jones delivered 22 quarts of milk to houses in one block, 13 quarts of milk to houses in another block, and 9 quarts of milk to houses in the third block. How many quarts of milk did he deliver to the houses in those three blocks?

6. Fifteen airplanes were at the airport. In one hour 3 airplanes took off and 6 airplanes landed. How many airplanes were at the airport then?

Lengths of Curves

1.



Look at this picture of a curve.

Place your string along the curve.

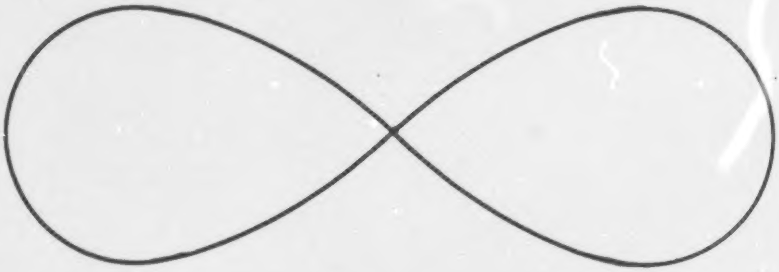
Measure the part of the string you used.

The length is ________ inches.

This is called the length of the curve.

You have used a string to find the length of a curve.

2.

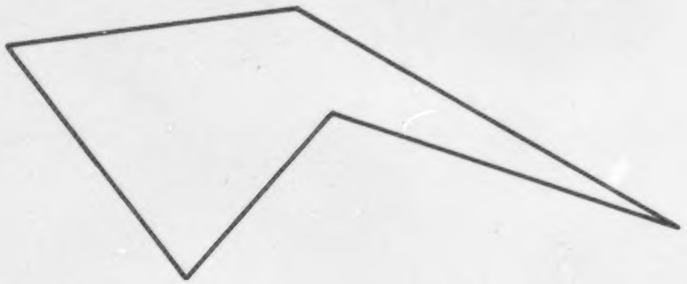


Look at this picture of a curve.

Use your string to measure it.

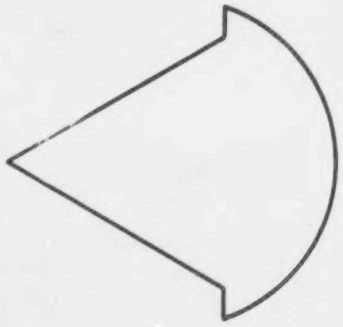
The length of this curve is ________ inches.

3. Use your string to find the length of the curve drawn below.



The length of the curve is _________inches.

4. Is the length of the curve below greater or less than 10 inches? ______________________________



How much less than 10 inches is it? ______________

Length

1. The seat of a chair is 15 inches from the floor. This is

   ____________inches more than a foot.

2. The length of the edge of a desk is 22 inches. This is

   ____________inches less than 2 feet.

3. Henry's seat is 7 feet from the door, while Harold's is
   3 yards from the door. Which one is farther from the door?

   ____

   How much farther? ____________feet.

4. To reach the drinking fountain Jane has to go 2 feet more
   than 4 yards. How many feet is this? ____________

5. Neil finds he is 14 feet from the chalkboard. Is this more or
   less than 6 yards? ____________

6. . aying Pin the Tail on the Donkey, Judy places the tail 10 inches from the correct spot. For Alice, the distance is 4 inches less than a foot. Who was the winner? ____________

7. Henry and James use a yardstick to find the height of a room. They find it is 2 feet more than 2 yards. The room is ________ feet high.

8. One space capsule was 5 feet, 8 inches high inside when in flight. The astronaut in his suit was 6 feet 5 inches tall. Could the astronaut stand up straight in the capsule? _________________

Why? ____

____

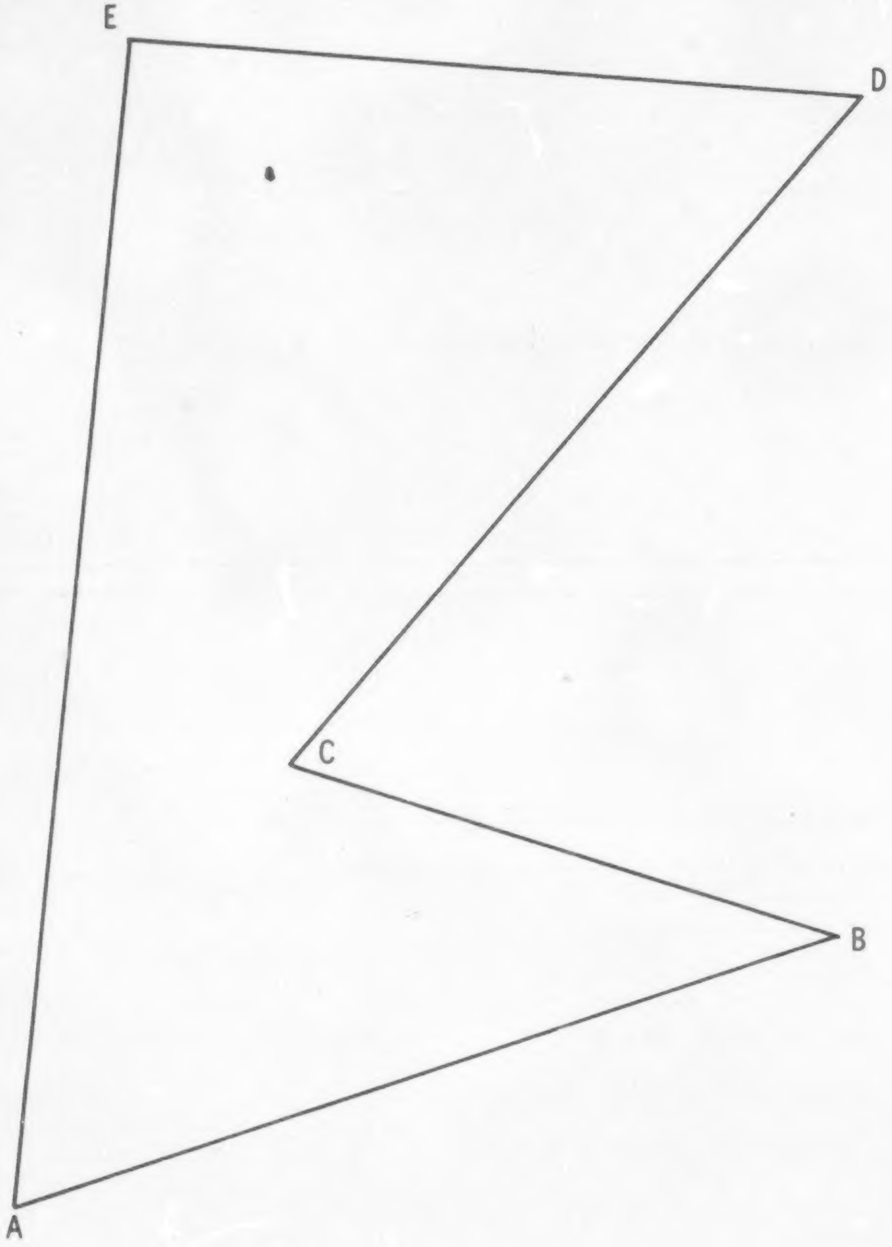
9. Amy's doll buggy is 5 feet, 5 inches long. Jerry's truck has a cargo body 1 foot, 9 inches long. Will Amy's buggy fit into the cargo body of Jerry's truck? _______________ Why? _______

____

____

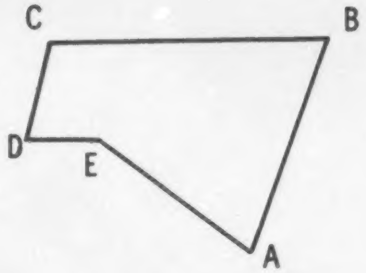
Perimeters

1. Find the perimeter. ____________



Perimeters

2. We will find the perimeter of the polygon drawn below.



Mark a segment congruent to $\overline{AB}$ on the line below, starting at O.

Next to it mark a congruent copy of $\overline{BC}$.

Make congruent copies of all the segments.

Call the last endpoint X.

Measure $\overline{OX}$.

The length of $\overline{OX}$ is ________ inches.

The measure of $\overline{OX}$ is ________.

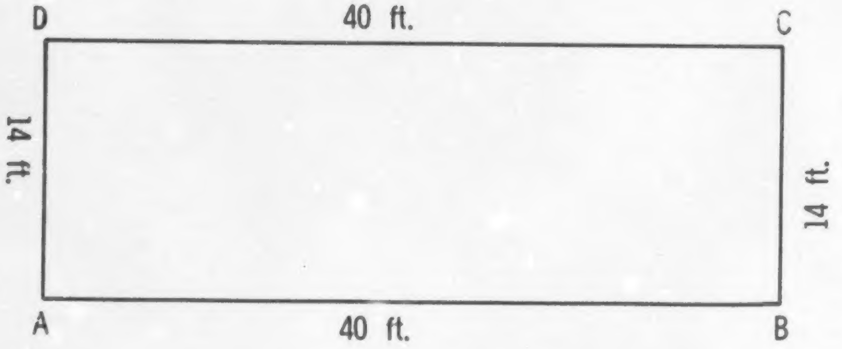
The perimeter of the polygon is ________ inches.

Perimeters

3. This is a picture of a playground.

We want to know how much fence is needed for the playground.

That means we want the ____________________ of the playground.



Below $\overline{AB}$ is a mark like this: 40 ft.

Does this mean that $\overline{AB}$ is 40 ft. long? _______________

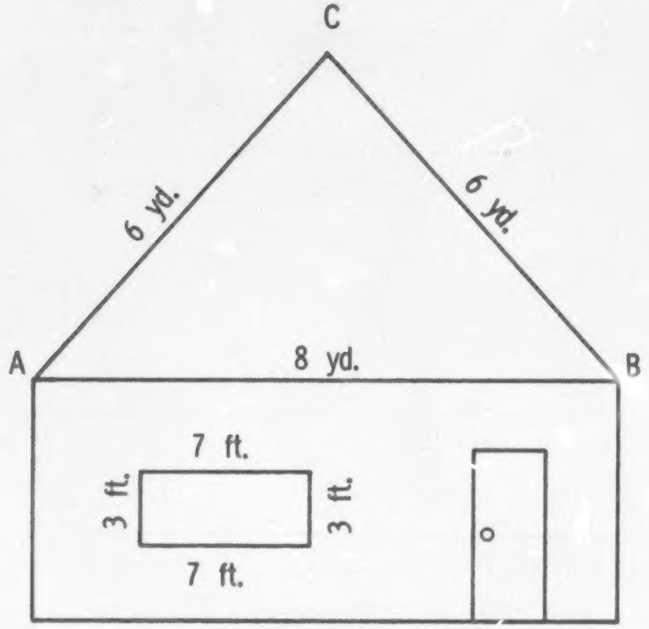
Write the mathematical sentence which we have to use.

____

The perimeter of the playground is ________________.

The length of fence needed is ________________.

4. The Jones family decided to decorate the front of their home for the Christmas season.



Johnny wanted to put a string of colored lights on the house along the triangle ABC.

Mary wanted to put a string of colored lights around the window.

Mr. Jones said he would buy lights for the window or the roof. He would not buy lights for both. He would decorate the one which required the shorter string of lights.

4. Johnny measured the three sides of the triangle.

He added the numbers in his measurements.

He wrote the equation

$$6 + 6 + 8 = 20.$$

Mary measured the four sides of the window.

She added the numbers in her measurements.

She wrote the equation

$$\underline{3 + 7 + 3} + 7 = 20.$$

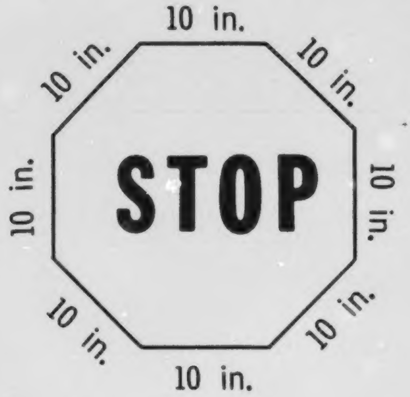
The two numbers were the same.

What other fact did Mr. Jones have to know? ______________________

Did the Jones family decorate the window or the roof? ______________

Review

1. This is a picture of a STOP sign. A thin black border is to be painted around the edge.


10 in.
10 in.
10 in.
10 in.
STOP
10 in.
10 in.
10 in.
10 in.

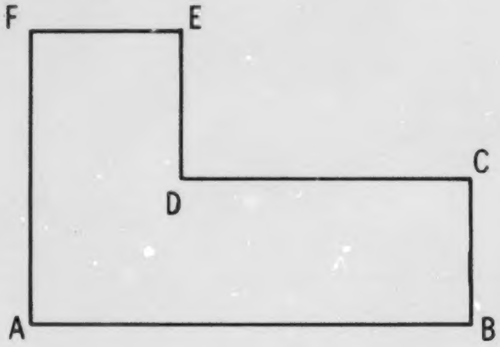
How many inches of border must be painted? ____________________

The edge of the sign is a polygon.

The perimeter of the polygon is ____________________.

The measure of the perimeter of the polygon is ____________________.

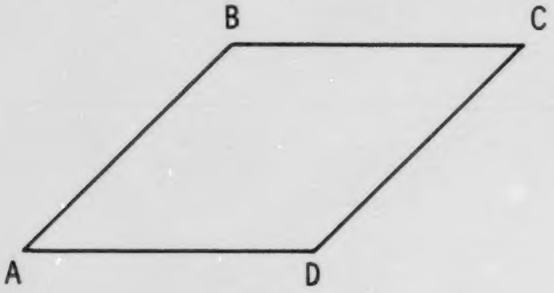
2. Use your ruler to find to the nearest inch the perimeter of the polygon below.



The perimeter of ABCDEF is ____________________.

Review

3. Use your ruler to find to the nearest inch the perimeters of the polygons below.

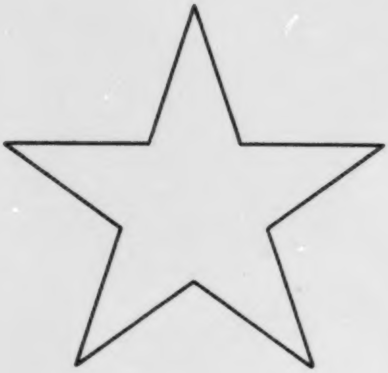


The perimeter of ABCD

is ______________.

The measure of ABCD

is ______________.



The perimeter of the star

is ______________.

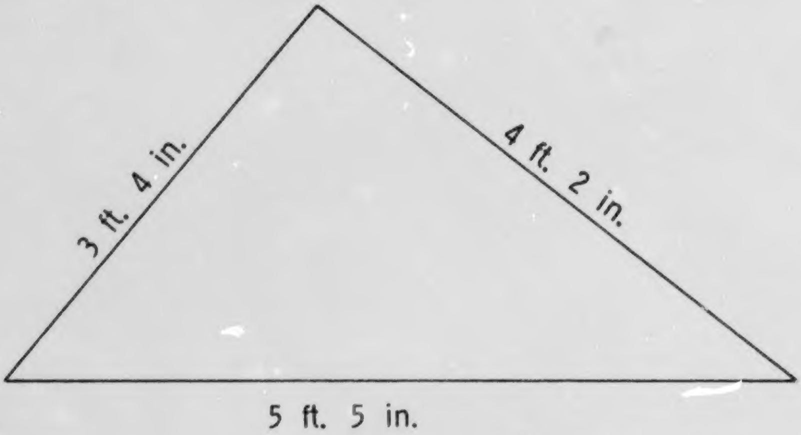
Using Several Units for Perimeters

1. Complete the table. Give another name for each length.

6 ft. 6 in.	
	43 in.
	21 in.
2 ft. 10 in.	
	67 in.
4 ft. 7 in.	

2. This is a picture of a triangle.

We shall find its perimeter.



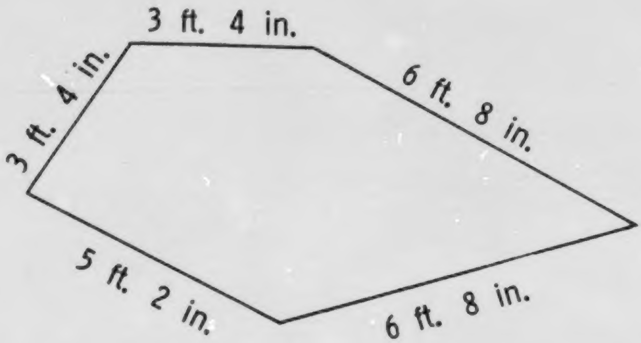
The equation for the number of feet is ____________________.

The equation for the number of inches is ____________________.

The perimeter is ____________________.

Using Several Units for Perimeters

3. This is a picture of a polygon.



How many sides does it have? __________

We shall find its perimeter.

The equation for the number of feet is ______________________.

The equation for the number of inches is ______________________.

The perimeter is __________ feet __________ inches.

Is the length shown in inches more than a foot? ________

The length in inches is the same as __________feet ________inches.

4. The lengths of the three sides of a triangle are

4 yd. 2 ft., 5 yd. 1 ft., and 3 yd. 2 ft.

The perimeter in yards and feet is ___________________________.

Review

1. The four sides of a flower bed have lengths 21 ft. 4 in., 10 ft. 6 in., 21 ft. 4 in., and 10 ft. 6 in.

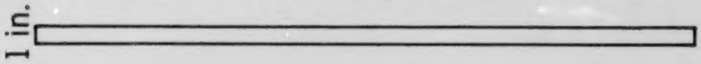
   A fence is built around it.

   The length of the fence is ______________________.

   Is the length shown in inches more than a foot? ______________

   If it is, write the length in a different way. __________________

2. This is a picture of a yardstick. It is one inch wide.

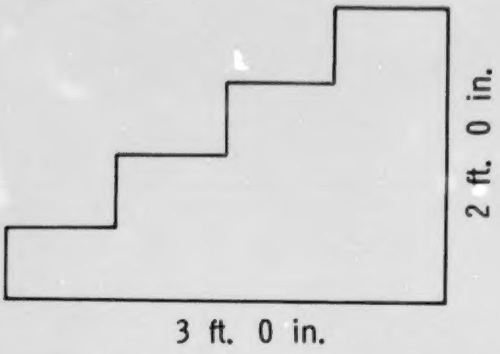


   Its perimeter in yards and inches is ______________________.

   Its perimeter in feet and inches is ______________________.

3. This is a picture of a polygon.

It looks like steps.

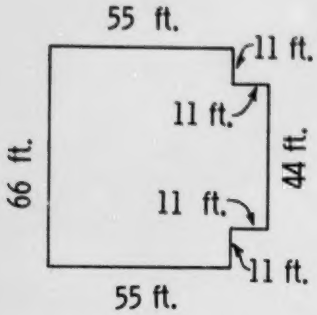

2 ft. 0 in.
3 ft. 0 in.

Each step is 6 inches high.

Each step is 9 inches wide.

The perimeter of this polygon is ______________________.

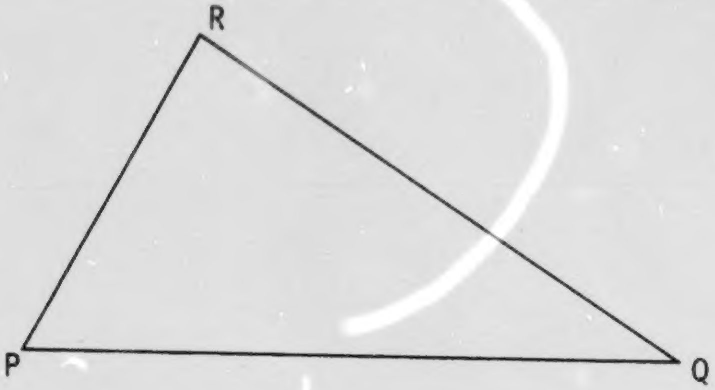
4. This might be a picture of a launching pad for an interplanetary missile.


55 ft.
11 ft.
11 ft.
66 ft.
44 ft.
11 ft.
11 ft.
55 ft.

What is the perimeter of the pad? ______________________

Measuring with Fractional Units

1.



Take your ruler.

Measure each side of $\triangle PQR$ in half inches.

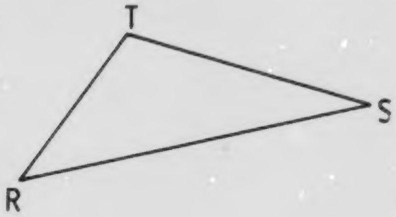
Length of $\overline{PQ}$ is ________ half-inches.

Length of $\overline{QR}$ is ________ half-inches.

Length of $\overline{PR}$ is ________ half-inches.

The perimeter of $\triangle PQR$ is ________ half-inches.

2.



Take your ruler.

Measure each side of $\triangle$RST in quarter inches.

Length of $\overline{RS}$ is ________ quarter-inches.

Length of $\overline{ST}$ is ________ quarter-inches.

Length of $\overline{RT}$ is ________ quarter-inches.

The perimeter of $\triangle$RST is ________ quarter-inches.

3. The sides of a triangle are

12 ins. 1 half-in.

13 ins. 0 half-in.

9 ins. 1 half-in.

The perimeter is ________________.

4. The sides of a triangle are

5 ins. 3 quarter-ins.

8 ins. 2 quarter-ins.

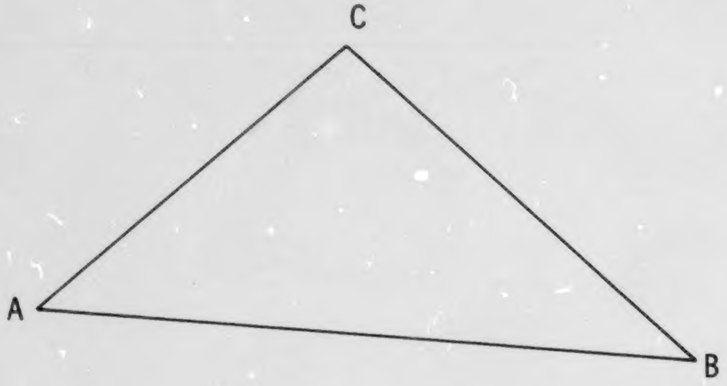
6 ins. 1 quarter-in.

The perimeter is ________________.

Review

1. Measure the sides of $\triangle ABC$ with your ruler.

   Show the results below.



Length of $\overline{AB}$ is ________ ins. ________quarter-ins.

Length of $\overline{BC}$ is ________ ins. ________quarter-ins.

Length of $\overline{AC}$ is ________ ins. ________quarter-ins.

The perimeter of $\triangle ABC$ is ________ ins. ________quarter-ins.

Do the quarter inches make more than an inch? __________

If so, write the perimeter in a different way.

________ in. ________ quarter-in.

Review

2. Sally is giving a party.
She wants to make a sash of ribbon.
It will take 27 ins. 3 quarter-ins.
She also wants to make a bow of ribbon.
This will take 15 ins. 3 quarter-ins.
She has 43 ins. of ribbon. Is this enough? ____________________

3. A rectangle has sides whose lengths are
3 ins. 1 half-in., 2 ins. 0 half-in.,
3 ins. 1 half-in., 2 ins. 0 half-in.
Is the perimeter as much as a foot? ________________
The perimeter is ________________.

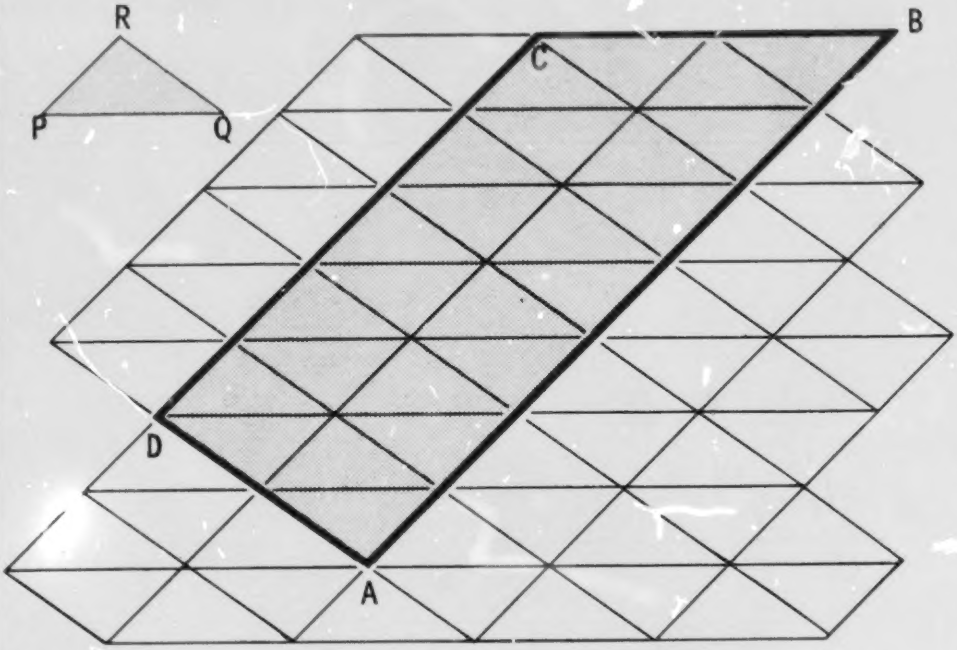
4. The edges of the cover of your pupil's book form a rectangle.
The sides have lengths, to nearest half-inch:

(bottom) _________ ins., _________ half-in.
(right side) _________ ins., _________ half-in.
(top) _________ ins., _________ half-in.
(left side) _________ ins., _________ half-in.

The perimeter is _________ ins., _________ half-ins.
The perimeter is ____________________ than 3 feet.
The perimeter is ____________________ than 4 feet.

Areas

1. Let the region bounded by $\triangle PQR$ be the unit region.



The regions in the drawing are congruent to region PQR.

Look at quadrilateral ABCD.

It is the edge of a region.

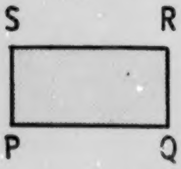
Count the number of unit triangular regions in region ABCD.

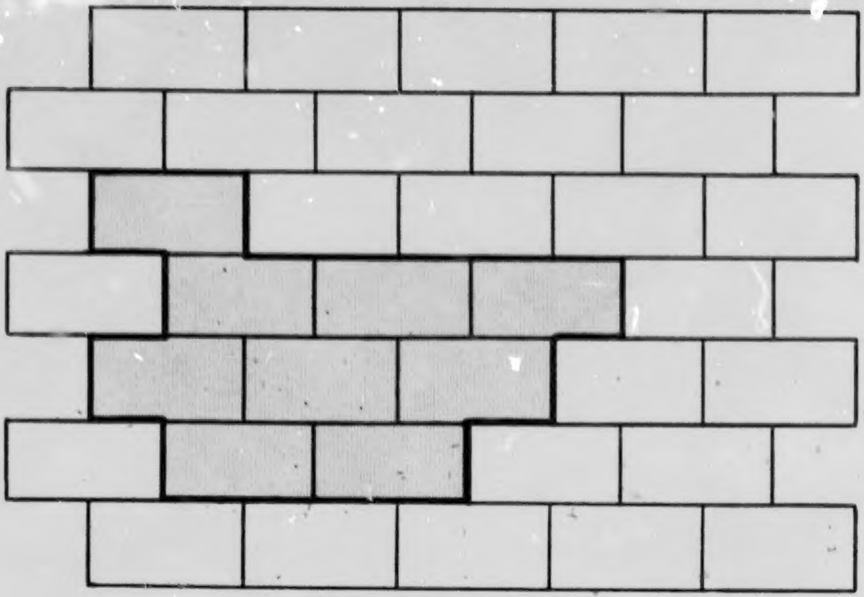
This area of the region is ________ units.

The measure of the region is ________.

2. Let region PQRS be the unit region.

The regions in the drawing are congruent to region PQRS.





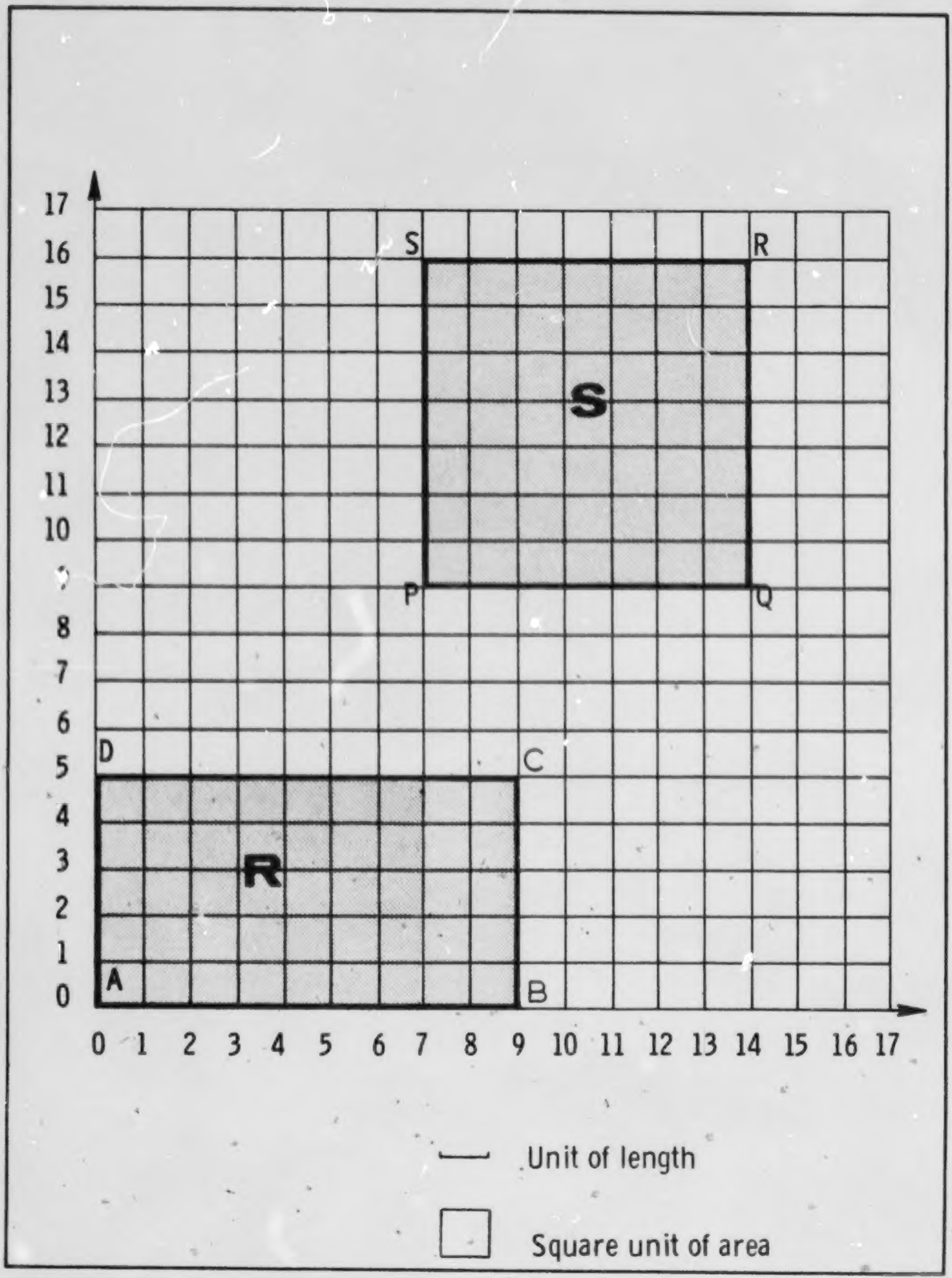
Look at the simple closed curve shown with heavy lines.

It is the edge of a region.

The area of this region is ________ units.

The measure of this region is ________.

Areas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Unit of length
Square unit of area

Look at the facing page.

See the units of length and area.

3. Look at rectangle ABCD.

It is the edge of a region called **R**.

The length of $\overline{AB}$ is ________ units.

R has ________ unit regions in each row.

The length of $\overline{AD}$ is ________ units.

R has ________ rows of unit regions.

An equation telling the number of square units in **R** is __________.

The area of **R** is ________ square units.

4. Look at rectangle PQRS.

It is the edge of a region called **S**.

The length of $\overline{PQ}$ is ________ units.

Could you use the numbers describing P and Q to find this? ______

The length of $\overline{PS}$ is ________ units.

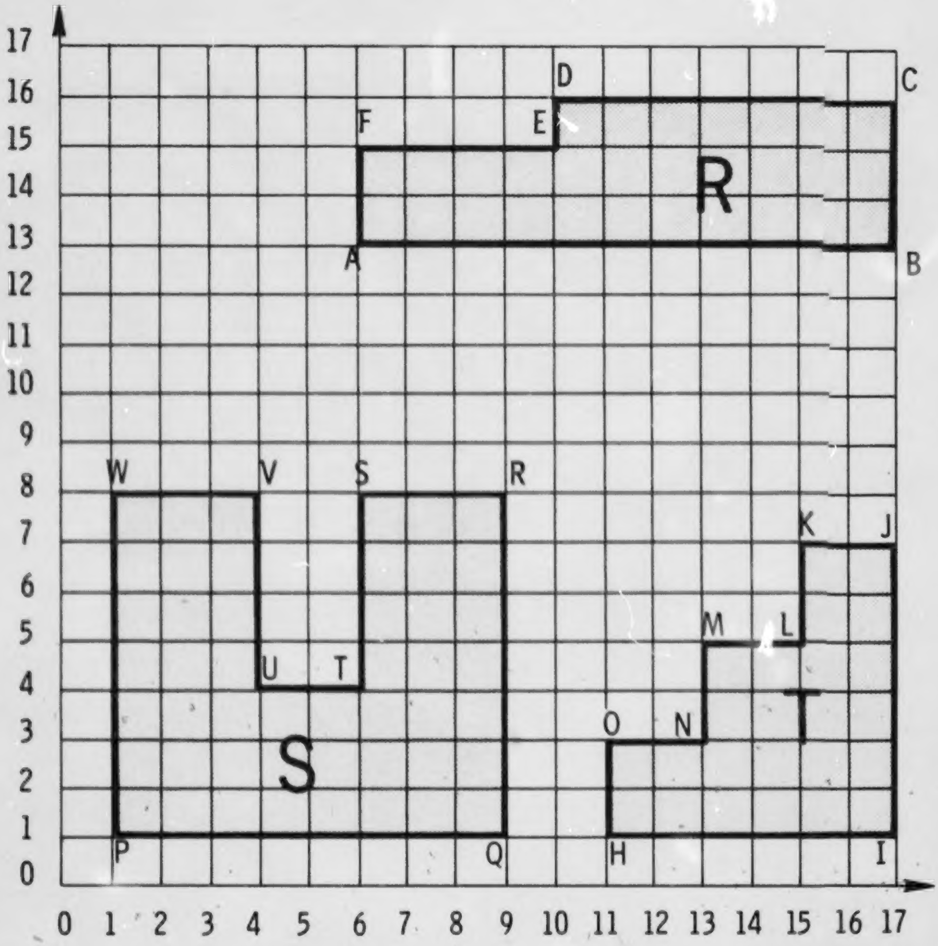
Could you use the numbers describing P and S to find this? ______

S has ________ unit regions in each row.

An equation telling the number of square units in **S** is _________.

The area of **S** is ________ square units.

Area



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R
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I

— unit of length

☐ square unit of area

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Look at the facing page.

1. ABCDEF is a simple closed curve.
   It is the edge of a region called **R**.
   The area of **R** is ________square units.

2. PQRSTUVW is a simple closed curve.
   It is the edge of a region called **S**.
   The area of **S** is ________square units.

3. HIJKLMNO is a simple closed curve.
   It is the edge of a region called **T**.
   The area of **T** is ________square units.

Area

1. Look at the facing page.

The area of region ABCD is ________ square units.

Join the following points in order:

(6, 5) (9, 5) (9, 7) (6, 7) (6, 5)

Call the figure PQRS.

The area of region PQRS is ________ square units.

The area of region ABCD which is outside region PQRS is ________ square units.

2. Look at the facing page.

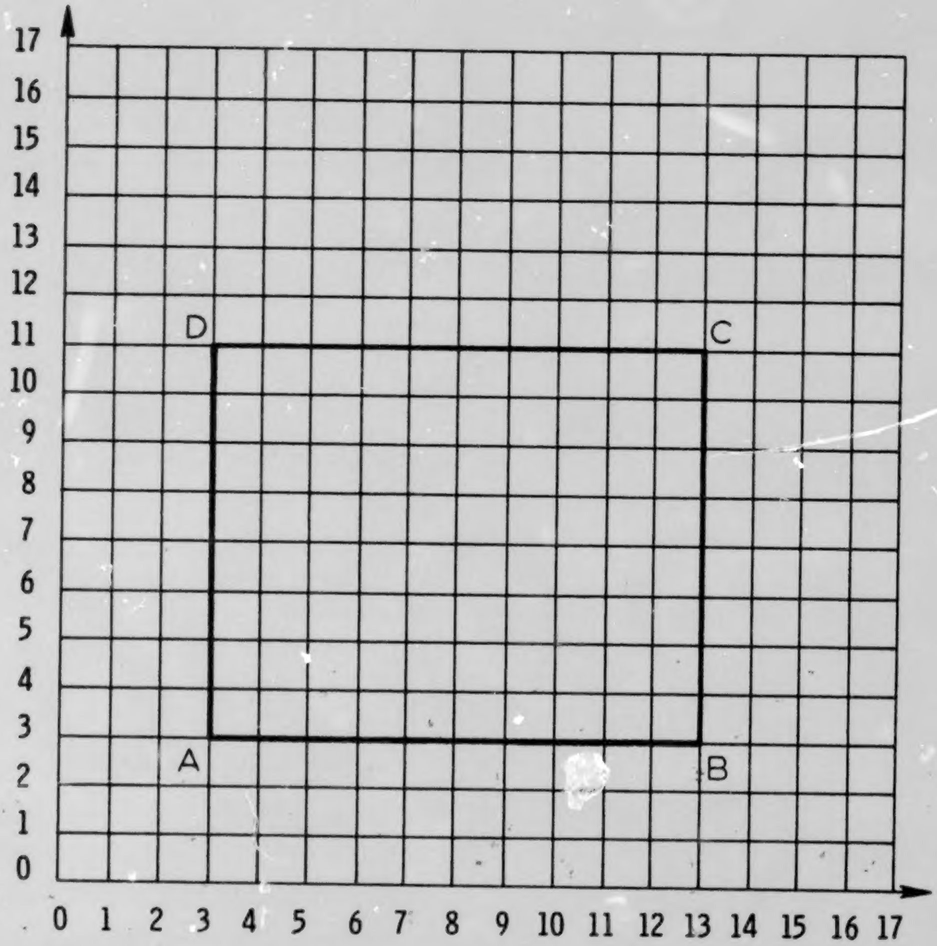
Join the following points in order:

(9, 12), (9, 15), (7, 15), (7, 16), (9, 16), (9, 17), (6, 17),
(6, 14), (8, 14), (8, 13), (6, 13), (6, 12), (9, 12).

What symbol does the resulting closed figure look like? ____________

What is the area of that closed figure? ____________ square units.

Area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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

— Unit of length

□ Square unit of area

Doubling Sides of Rectangles

1. Draw rectangle ABCD if the numbers describing the points are A(1, 2) B(4, 2) C(4, 6) D(1, 6).

   Double these numbers to get points P(,) Q(,) R(,) S(,).

   Draw rectangle PQRS.

   The perimeter of ABCD is ________ units.
   The perimeter of PQRS is ________ units.

   The perimeter of PQRS is ________ times as large as the perimeter of ABCD.

   Write the equation used to find the area of region ABCD.

   ____

   Write the equation used to find the area of region PQRS.

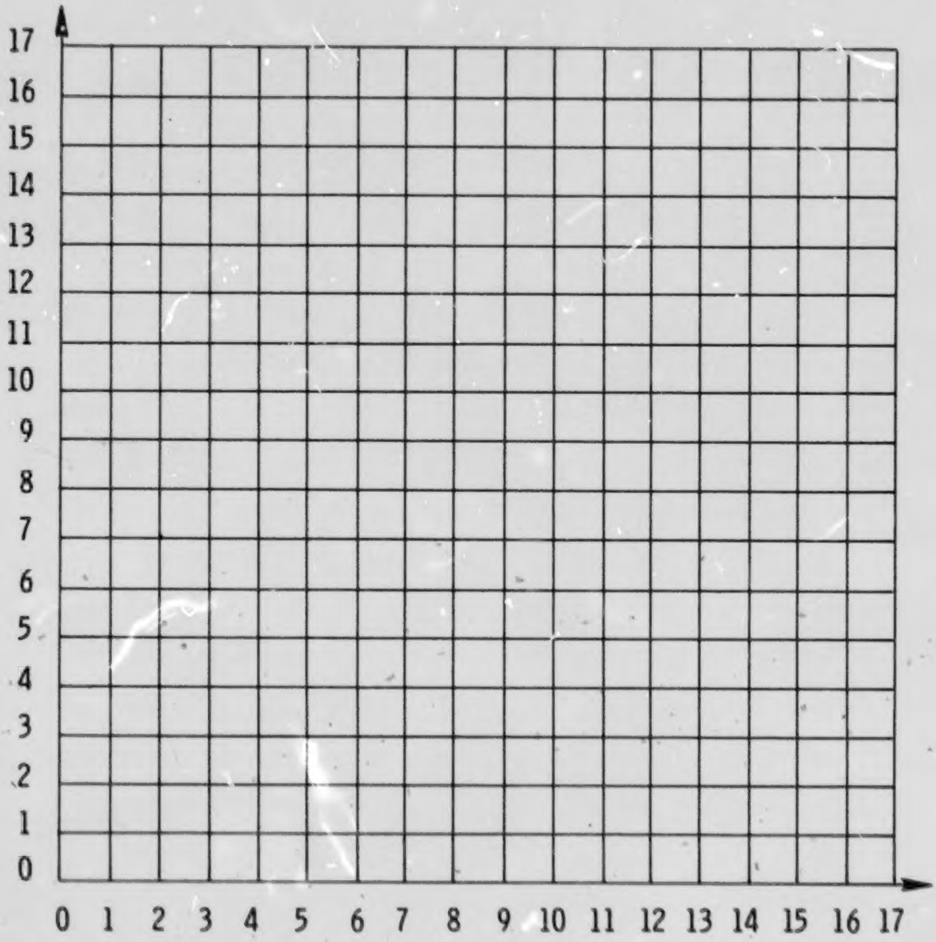
   ____

   The area of region ABCD is ________ square units.
   The area of region PQRS is ________ square units.

   The area of PQRS is ________ times as large as the area of ABCD.

Doubling Sides of Rectangles

1.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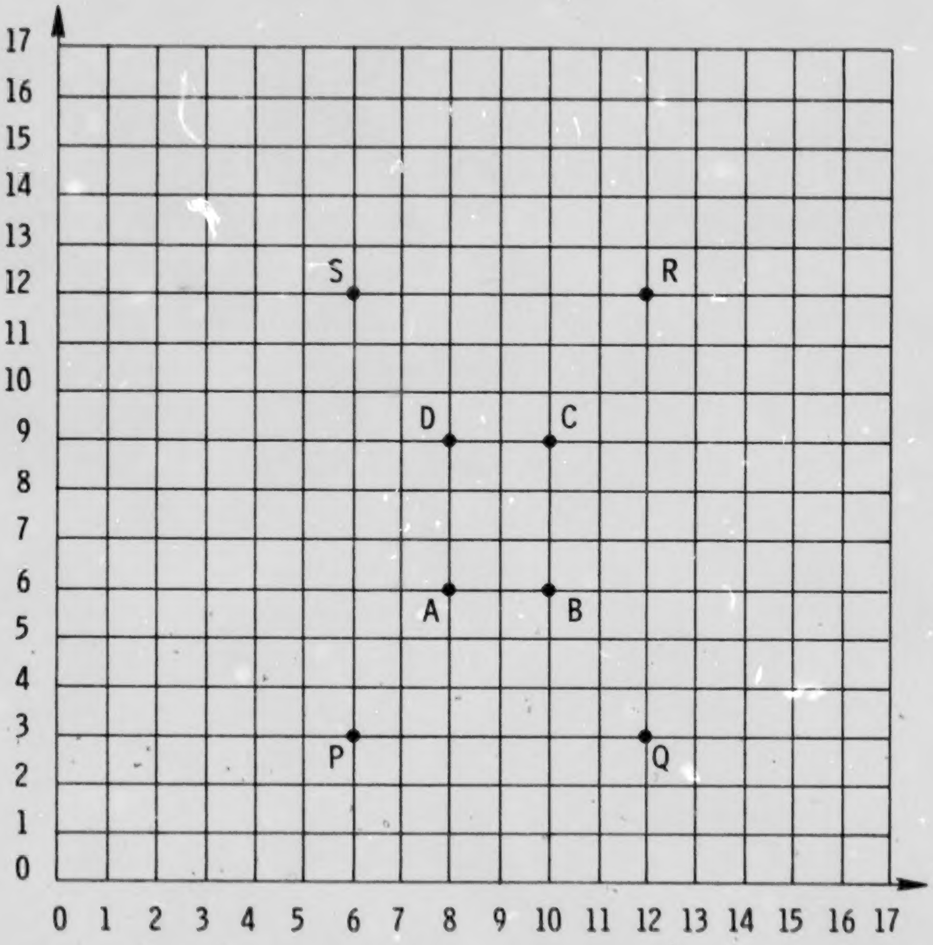
Tripling Sides of Rectangles

2.



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D
C
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B
P
Q
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

The numbers describing A, B, C, D, are

A(,), B(,), C(,), D(,).

The numbers describing P, Q, R, S, are

P(,), Q(,), R(,), S(,).

Draw rectangle PQRS.

Tripling Sides of Rectangles

Look at the facing page.

2. ABCD and PQRS are similar rectangles.

   Write the equation used to find the perimeter of ABCD.

   ____

   The perimeter of ABCD is ________ units.

   Write the equation used to find the perimeter of PQRS.

   ____

   The perimeter of PQRS is ________ units.

   The perimeter of PQRS is ________ times the perimeter of ABCD.

   Extend $\overline{AB}$ and $\overline{CD}$ to meet $\overline{SP}$ and $\overline{QR}$.

   Extend $\overline{AD}$ and $\overline{BC}$ to meet $\overline{RS}$ and $\overline{PQ}$.

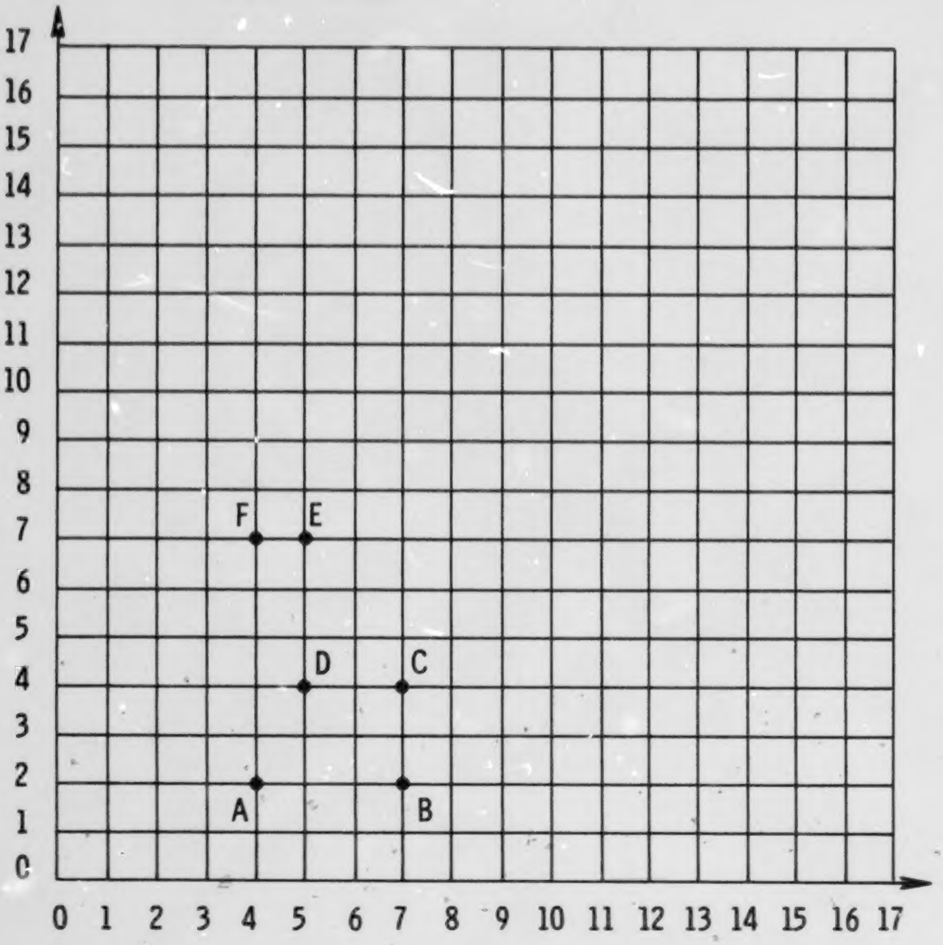
   These lines divide region PQRS into ________ smaller regions.

   Each region is congruent to ABCD.

   The area of region PQRS is ________ times the area of region ABCD.

Doubling Sides of Regions

3.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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

3. ABCDEF is a simple closed curve.
It is the edge of a region called **R**.
The perimeter of ABCDEF is ________ units.
The area of **R** is ________ square units.

Double the numbers describing points A, B, C, D, E, F.
Label the new points P, Q, R, S, T, U.

PQRSTU is the edge of a region called **S**.
The perimeter of PQRSTU is ________ units.
The area of **S** is ________ square units.

The perimeter of PQRSTU is ________ times as long as
the perimeter of ABCDEF.

The area of **S** is ________ times as large as the area of **R**.

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4. Two sides of a rectangle are 5 inches and 7 inches.

   The area is ________________.

5. The area of a rectangle is 48 square inches. One of the sides is 6 inches long. Write an equation for the number n of inches in the other side.

   ____

   The length of the other side is ________________.

6. The area of a rectangle is 36 square inches. One of the sides is 6 inches. Write an equation for the number n of inches in the other side.

   ____

   The length of the other side is ________________.

   This rectangle is a ________________________.

7. The area of a square is 25 square feet. Write an equation for the number n of feet in each side.

   ____

   The length of each side is ____________________.

Congruence and Area

1. Look at the facing page.

See the simple closed curve ACDEFG.

This is the edge of a region.

The area of this region is ________ square units.

Find the point whose coordinates are (7, 8). Mark it H. Draw $\overline{HE}$.

The area of region ACDH is ________ square units.

The area of region HEFG is ________ square units.

Is region ACDEFG the union of region ACDH and region HEFG?

____

Find the point whose coordinates are (9, 5). Mark it B. Draw $\overline{BE}$.

The area of region ACDH is ________ square units.

The area of region ABFG is ________ square units.

Is region ACDEFG the union of region ACDH and region ABFG?

____

Is the number of square units in ACDEFG the sum of the numbers ACDH and ABFG? ____________

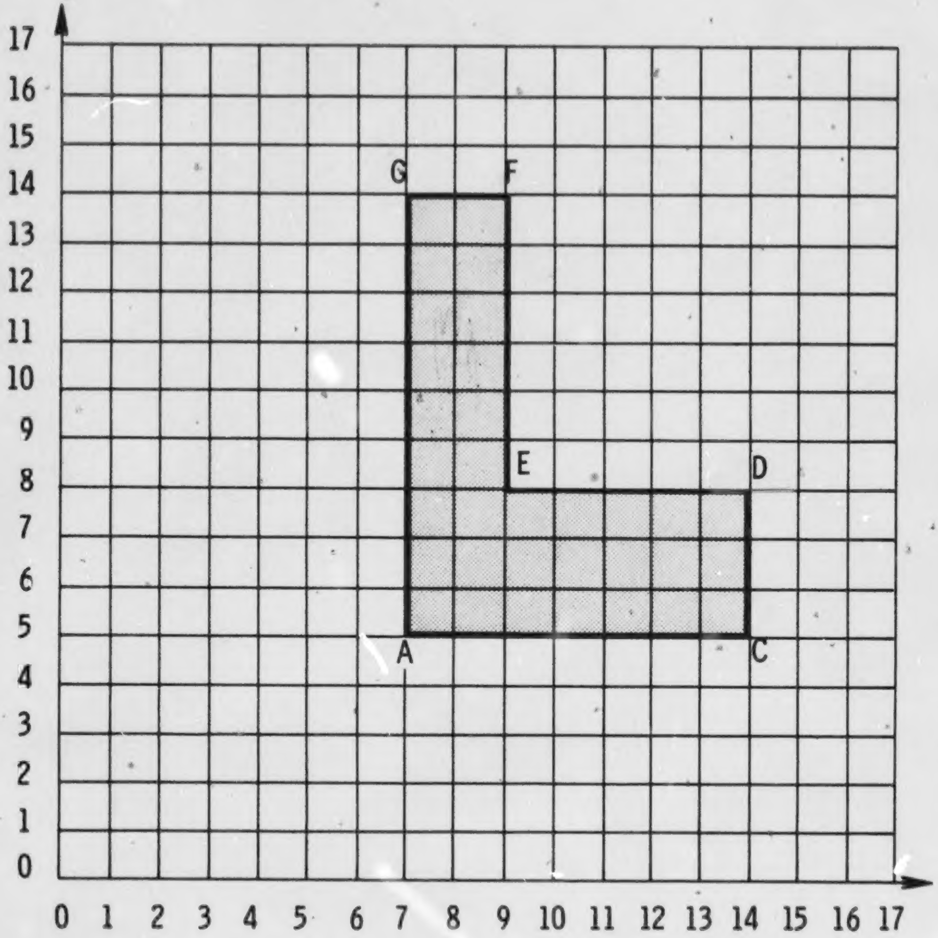
What is the area of the region ABEH? ________ square units.

Subtract this number from the sum of the numbers for the areas of ACDH and ABFH. The difference is ____________________.

How does this number compare with the number for the area of the region ACDEFG? ________________________________

Congruence and Area

1.



G
F
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D
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C
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

2. Look at the facing page.

Find point D(13, 9).

Draw $\overline{CD}$ and $\overline{BD}$.

ABDC is a ______________________________.

The area of region ABDC is _________ square units.

Is △ABC congruent to △DEC? ___________

Do regions ABC and DEC have the same area? _________ Why?

____

Does the number of square units in region ABDC equal the sum of the numbers for ABC and DEC? ________ Why? ____________

____

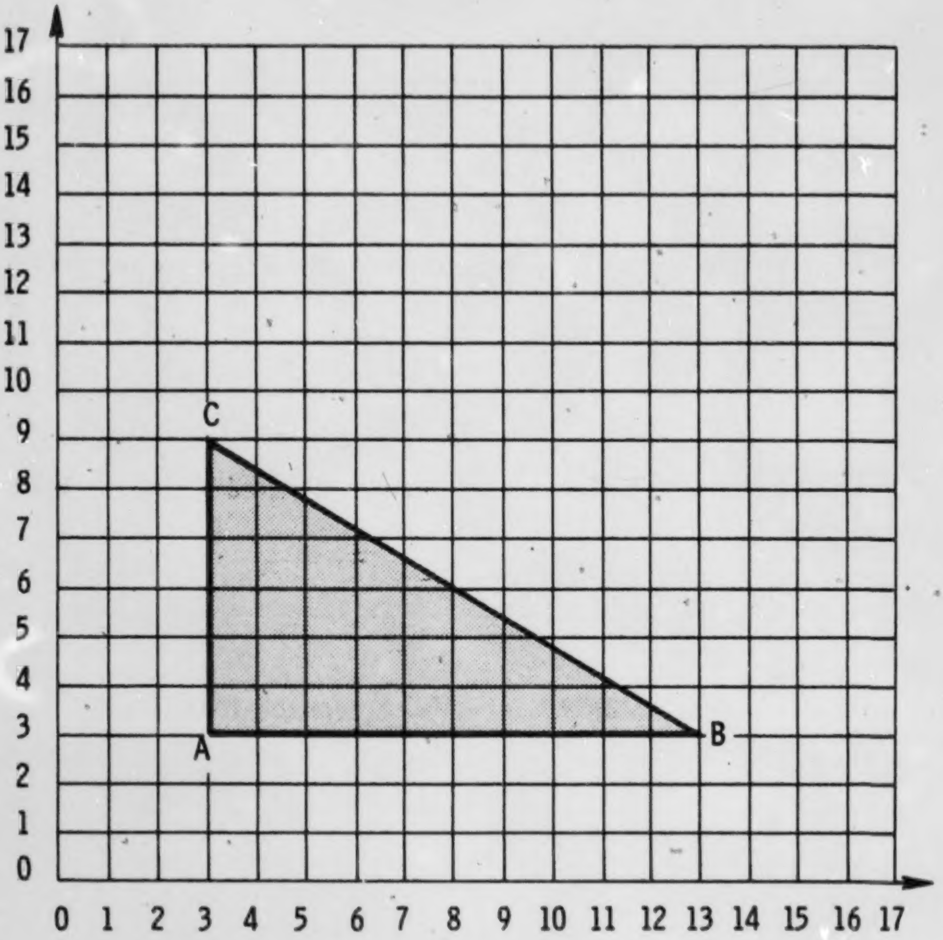
The number of square units in region ABDC is twice the number for region ABC. Why? ____________________________________

____

The area of region ABC is _________ square units.

This number is _________ of that for the area of the rectangle ABDC.

2.


C
A
B
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

3. Look at the facing page.

ACDF is a quadrilateral.
It is the edge of a region.
We shall find the area of region ACDF.

The area of region ABEF is the same as the area of region CPQD.
Why? ____

____

The area of region ACDF is the same as the area of region BPQE.
Why? ____

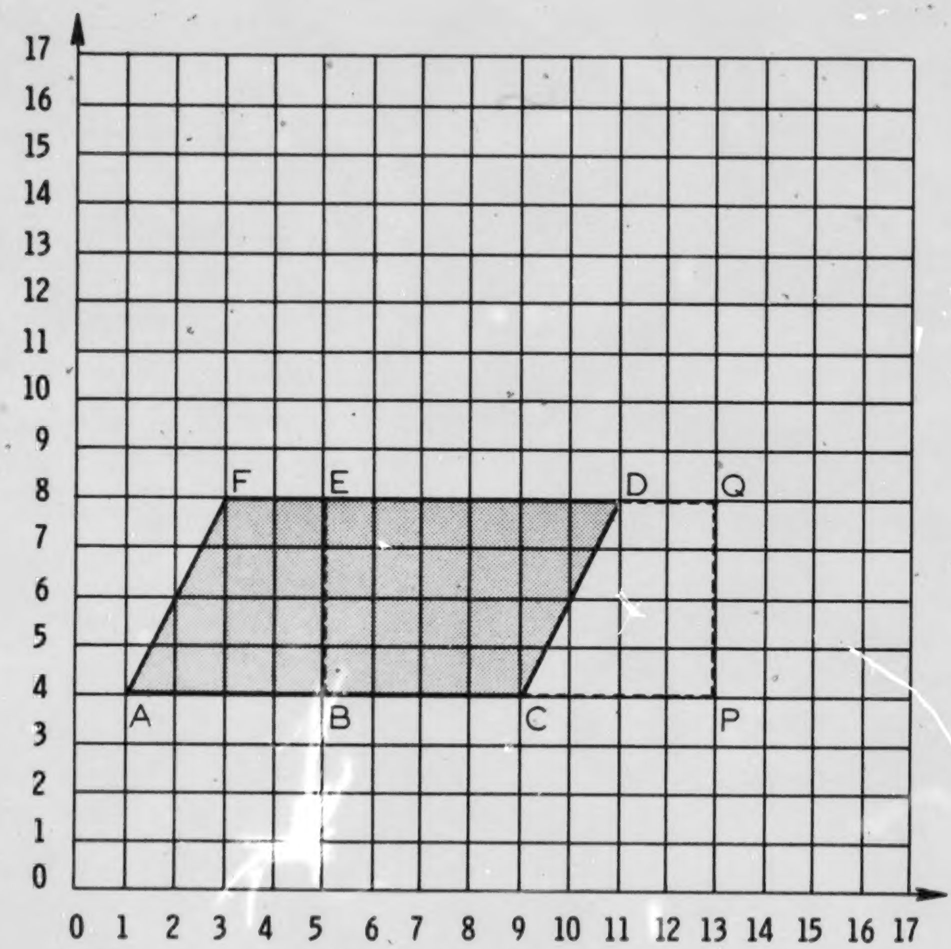
____

The area of region BPQE is ________ square units.
Why? ____

____

The area of region ACDF is ________ square units.

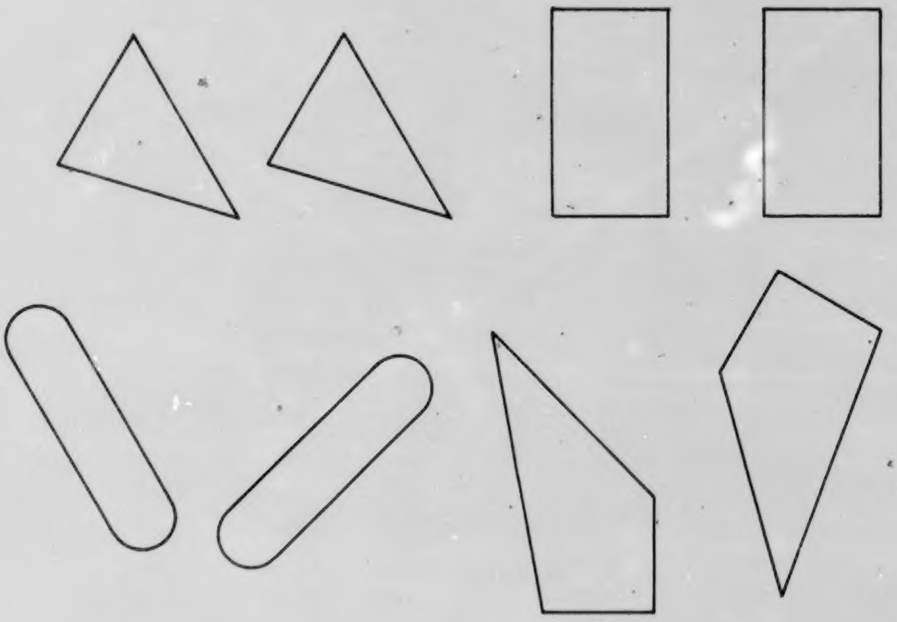
3.


F
E
D
Q
A
B
C
P
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

SUPPLEMENTARY

Further Work with Areas

You know what is meant by congruent figures. Below are some pairs of congruent simple closed curves.



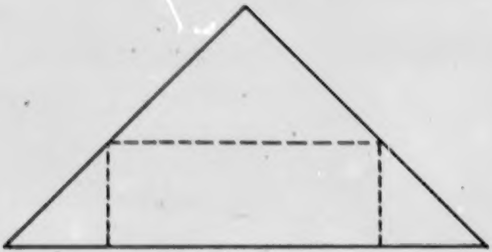
A simple closed curve is the boundary of a region.

If two simple closed curves are congruent, are their regions congruent? ________

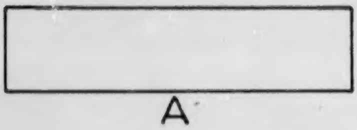
Does the picture show pairs of congruent regions? ________

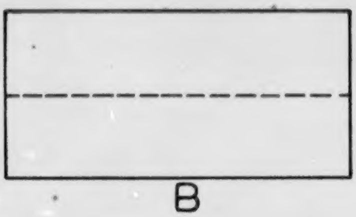
2. We know that congruent regions have equal areas.

If a tracing of one region can be made to fit entirely inside another region, then the first figure has a smaller area than the second. For example, the rectangular region below has a smaller area than the triangular one because a tracing of the rectangle can be made to fit inside the triangle as shown by the dashed line.



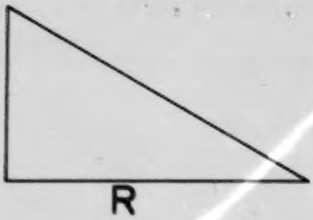
3. Exactly two regions congruent to A will fit into region B.



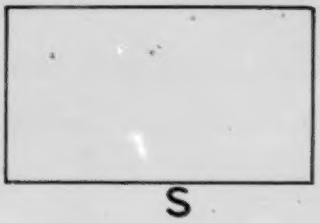


Then region B has exactly twice the area of region A.

4.



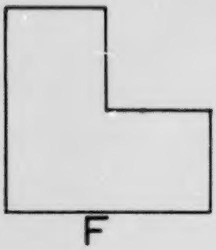
R



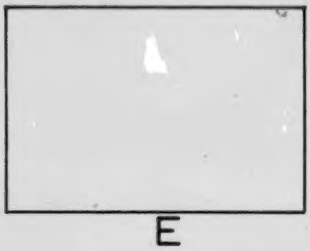
S

Show by tracing and fitting that region S has exactly twice the area of region R .

5. Show by tracing and fitting that region E below has exactly twice the area of region F . Draw a dashed line to show how you did the fitting.

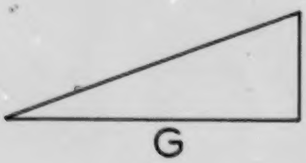


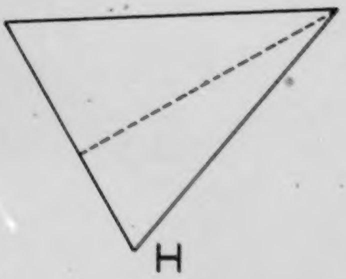
F



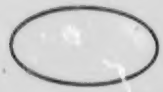
E

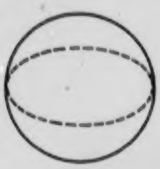
6. Look at regions G and H below. It is possible to fit two regions congruent to G inside H so that there is space left over. This shows that triangle H has more than twice the area of triangle G. Show by dashed lines how to do the fitting.

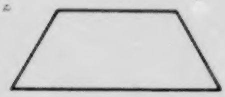


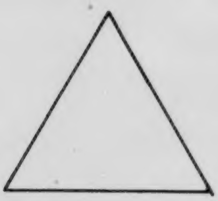


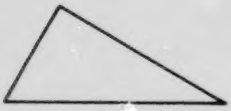
7. Use tracing paper to show how the left-hand region in each pair below can be made to fit inside the right-hand figure.

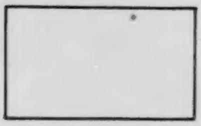






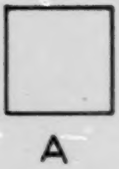


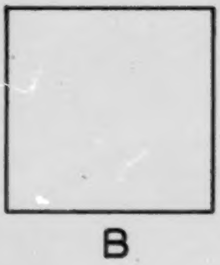




In each example, fit as many regions congruent to region A inside B as you can. Complete the sentences that tell about the areas.

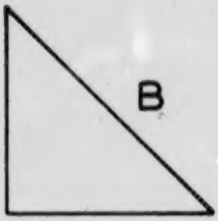
1.

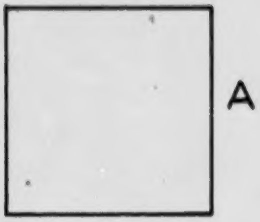




The area of B is exactly ________ times the area of A.

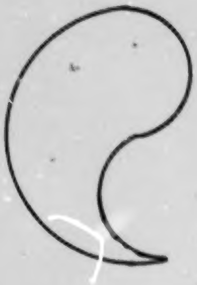
2.



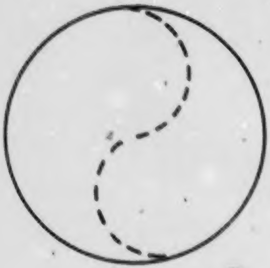


The area of A is exactly ________ times the area of B.

3.



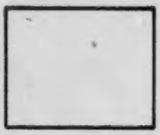
A



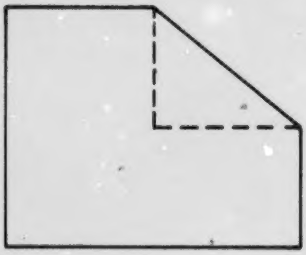
B

The area of B is exactly ________ times the area of A.

4.



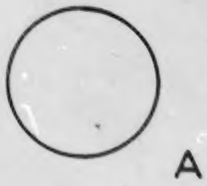
A

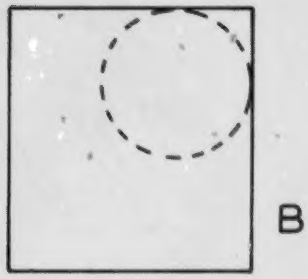


B

The area of B is more than ________ times the area of A.

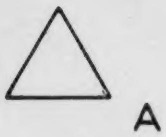
5.

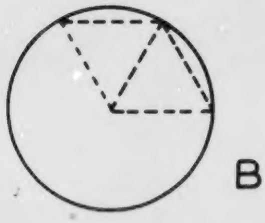




The area of B is more than ________ times the area of A .

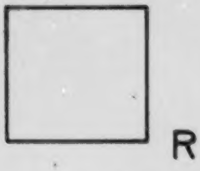
6.

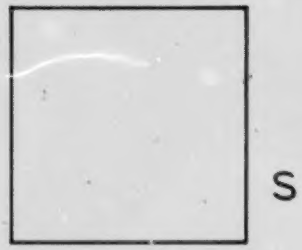




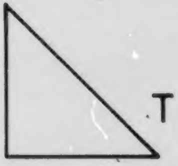
The area of B is more than ________ times the area of A .

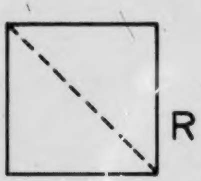
7. Look at these two square regions.

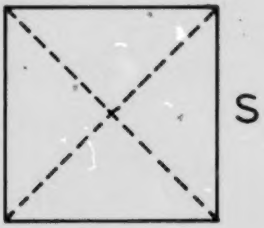




We can fit one square region congruent to R inside S with some space left over, but we cannot fit two regions congruent to R inside S without overlapping. The fact is, however, that the area of S is exactly 2 times the area of square R . Can you think how we could know this? Here is a simple way to show it.

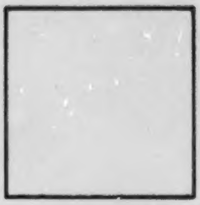


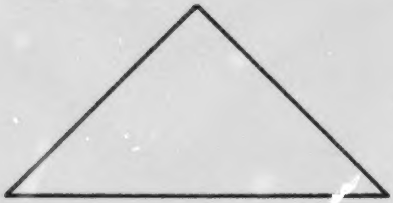




The area of R is exactly _________ times the area of T . The area of S is exactly _________ times the area of T . Four things are twice as many as two things. Therefore, the area of S is twice the area of square R .

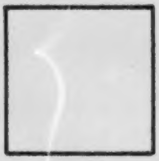
How can you show that this square and this triangle have the same area?



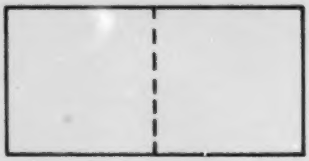


Answer: ____.

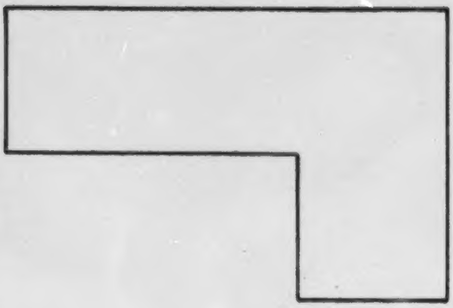
Here is a square region whose sides are one inch long.



We say that the area of this region is one square inch.



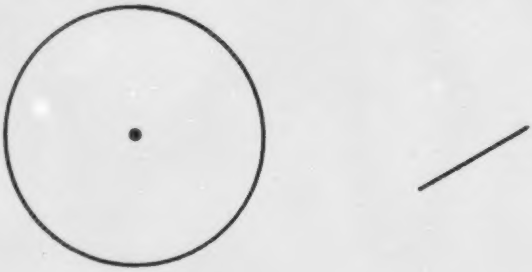
The area of this rectangular region is two square inches.



The area of this region is ________ square inches.

To finish this section let's try to find out something about the area of circular regions. Below is a circle. The point in the middle is called the center of the circle. Next to the circle is a line segment. Make a tracing of the line segment and put one end of your tracing on the center of the circle. Where does the other end of the segment lie? ________________

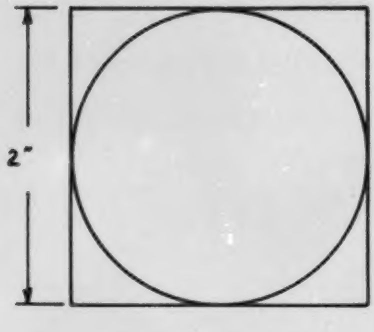
The length of the segment is called the radius of the circle.



The radius of this circle is exactly one inch.

What can we find out about the area of the region enclosed by the circle?

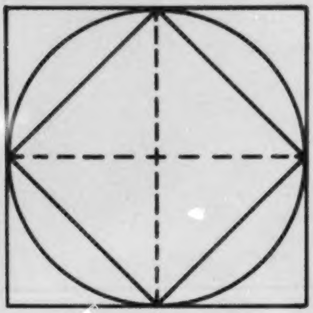
To begin with, we can put our circle inside a square whose sides are two inches long.



The area of the square region is ________ square inches.

The area of the circular region is less than ________ square inches.

Now we can put another square inside the circle.



Can you find the area of the inside square region? ________

Hint: Divide the region into four triangular regions.

Does this remind you of something you did before? ________

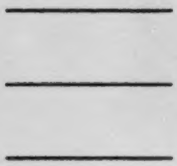
The area of the circular region is more than ________ square inches.

We have seen that the area of the circular region whose radius is one inch is more than ________ square inches, but less than ________ square inches.

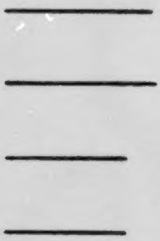
Later on you will learn that the area of this region is just a little more than 3 square inches.

*Line Segments

1. Here are three line segments. Draw a triangle with sides congruent to these segments.



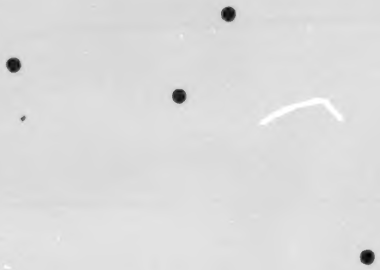
2. Here are four line segments. Draw a quadrilateral with sides congruent to these segments, and draw it so that it will fit inside the triangle you just drew.



3. I have two triangles A and B. Every side of A is longer than every side of B, and yet I cannot fit triangle B inside triangle A! How is this possible? Can you show by a drawing?

Line Segments and Sums

1. Here are four points:

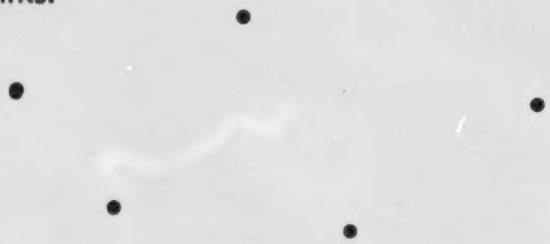


Join every pair of points with a line segment.

How many segments did you draw? ________

Find the sum: 3 + 2 + 1 + 0 = ________

2. Here are five points:

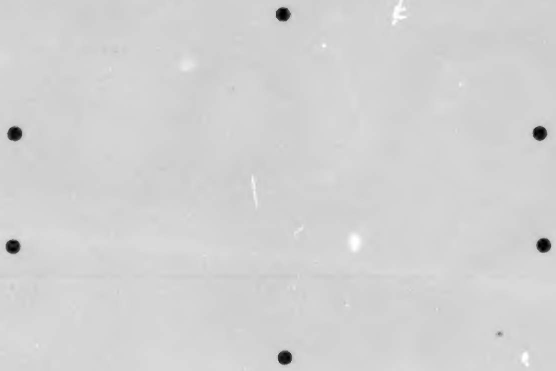


Join every pair of points by a line segment.

How many segments did you draw? ________

Find the sum: 4 + 3 + 2 + 1 + 0 = ________

3. Here are six points:



Again, join every pair of points by a line segment.

How many segments this time? ________

Find the sum: 5 + 4 + 3 + 2 + 1 + 0 = ________

Was the sum the same as the number of segments every time? ________

If not, go back and check your work.

4. Now try it for three points. Figure out what numbers you should add.

Number of segments: ________

____ + ____ + ____ = ____

Does it work? ______ Does it work for two points? ________

For one point? ______ Now add a fourth point to the three you have up above. How many new segments can you draw? ______

What new number should you add to the sum? ________

Now think about what you have done and try to explain why the sum should always be the same as the number of segments.

____

____

____

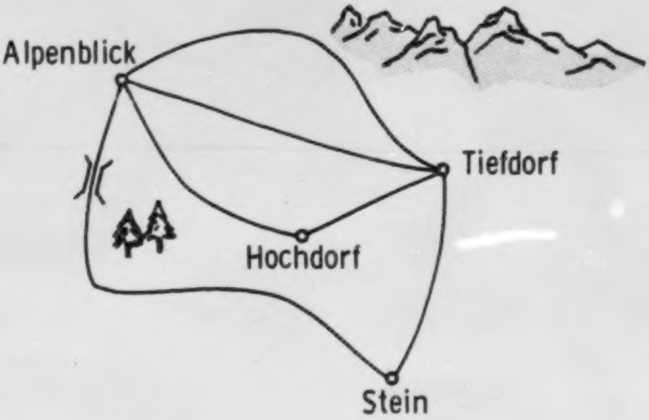
5. Without drawing anything figure out how many line segments it would take to join all pairs in a set of ten points:

__ + __ + __ + __ + __ + __ + __ + __ + __ + __ = __

If you rearrange these numbers in the right way the addition is very easy.

Routes

I am staying in Hochdorf, a village high in the Alps. I would like to take a trip starting and ending at Hochdorf and passing over every road exactly once. Trace out a route for me.

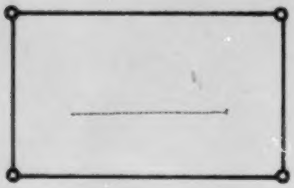


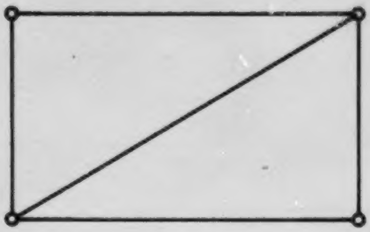
1. We call a route which starts and ends at the same point and passes over every road exactly once an Euler route after the famous Swiss mathematician Leonhard Euler (pronounced "Oiler") who first worked problems of this kind. Find an Euler route starting and ending at Stein. If there is an Euler route starting and ending at one point is there necessarily an Euler route starting and ending at every other point? ________ Why? ____

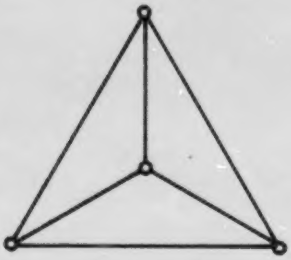
   ____

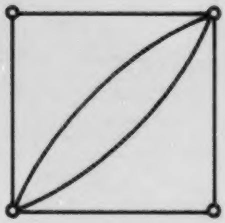
   ____

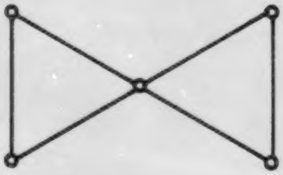
2. Try to find an Euler route for each of the maps below. Start at any point you like, but be sure to end at the same point. Put a big X on each map which has no Euler route.

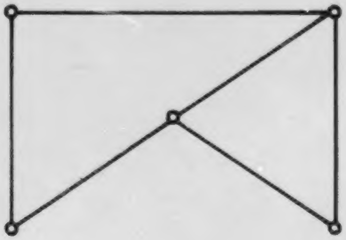






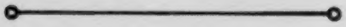




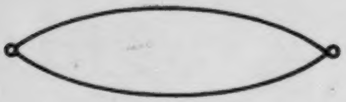


Can you think of any simple rule to tell you when a map will have an Euler route and when it will not? Look back at the maps above.

3. Now look at these maps. Mark with X those maps which have no Euler route.



____



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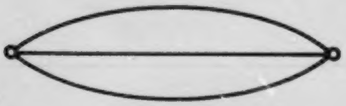

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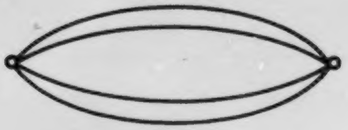

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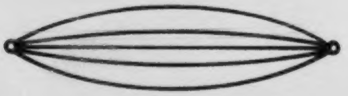
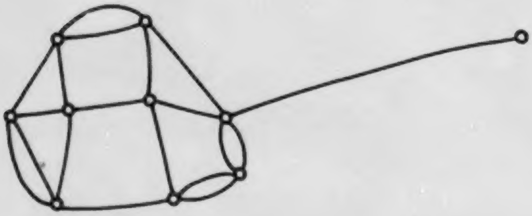


____

What do you notice? ____

Anything about even and odd... ?

If you look carefully you can tell right away that each of these maps has no Euler route. Explain how on the line under each map.



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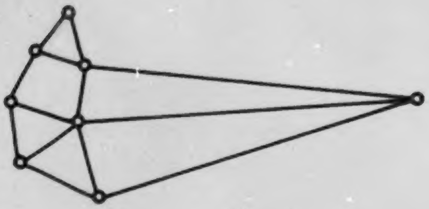
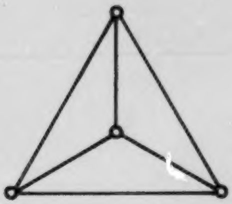
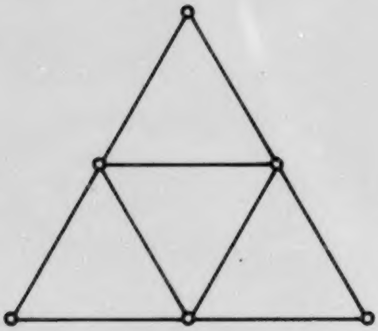
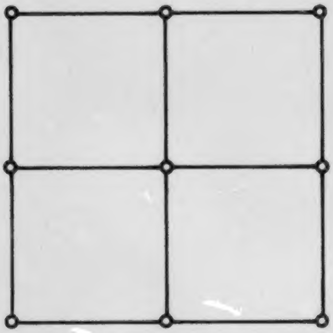




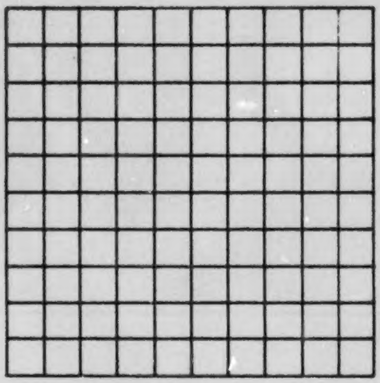
4. Now can you think of a simple rule to tell you when a map has no Euler route? ______________________________

Try your rule on these:





Multiplying With Ten



Use the array above to help you fill the blanks.

Is there an easy way when 10 is one of the numbers?

2 × 10 = ____

4 × 10 = ____

10 × 1 = ____

10 × 3 = ____

5 × 10 = ____

10 × 5 = ____

8 × 10 = ____

9 × 10 = ____

10 × 7 = ____

4 × ____ = 40

10 × ____ = 50

3 × ____ = 30

2 × ____ = 20

____ × 7 = 70

____ × 1 = 10

8 × ____ = 80

10 × ____ = 0

6 × ____ = 60

A Multiplication Table

Can you make a multiplication chart to include 10? Try it.

×	0	1	2	3	4	5	6	7	8	9	10

Multiplying with 10 and 100

Fill the blanks:

45 × 10 = _____
10 × 35 = _____
72 × 10 = _____
12 × 10 = _____
7 × 10 = _____
9 × 10 = _____
10 × 50 = _____
10 × 39 = _____
4 × 100 = _____
6 × 100 = _____
9 × 100 = _____
6 × 10 = _____
10 × 84 = _____
3 × 10 = _____
24 × 10 = _____
18 × 10 = _____
37 × 10 = _____

17 × 10 = _____
10 × 72 = _____
100 × 7 = _____
5 × 100 = _____
100 × 35 = _____
27 × 10 = _____
64 × 10 = _____
10 × 53 = _____
10 × 47 = _____
68 × 10 = _____
6 × 10 = _____
8 × 10 = _____
10 × 11 = _____
20 × 100 = _____
17 × 100 = _____
100 × 82 = _____
21 × 10 = _____

Multiplying with Ten and a Hundred

Complete:

40 = 4 × ____

30 = 3 × ____

60 = 6 × ____

70 = ____ × 10

80 = ____ × 10

50 = 5 × ____

120 = ____ × 10

360 = ____ × 36

450 = 45 × ____

700 = 7 × ____

620 = ____ × 10

840 = ____ × 10

1500 = ____ × 100

720 = ____ × 10

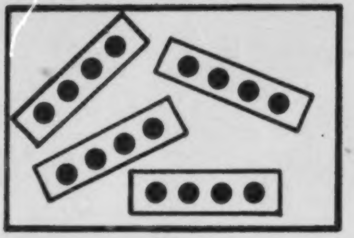
2700 = 27 × ____

3900 = 39 × ____

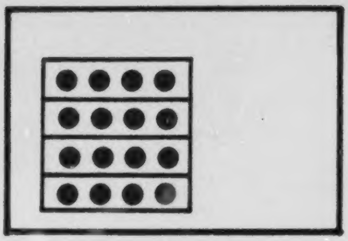
4500 = ____ × 100

6000 = ____ × 100

Using Multiplication



Picture A



Picture B

Look at Picture A.

How many cards of buttons do you see? ________

How many buttons are on each card? ________

Look at Picture B.

The cards of buttons have been put together.

What multiplication equation tells you how many buttons there are?

____

Using Multiplication

Draw a line to the equation that is related to each problem.

Tom had 5 coins on each card.
He has 7 cards of coins.
How many coins did he have?

Mary had 3 boxes of pencils.
There were 6 pencils in each box.
How many pencils did she have?

Karen can put 4 flowers in each vase.
All together she had 28 flowers.
How many vases does she need?

Tom wants to give each of his friends 5 marbles.
He needs 35 marbles.
How many friends will get marbles?

Bill went on a 7 day vacation.
He caught the same number of fish each day.
That week he caught 42 fish.
How many fish did he catch a day?

$7 \times 42 = n$

$3 \times 6 = n$

$7 \times 5 = n$

$6 \times 3 = n$

$n \times 7 = 42$

$n \times 5 = 35$

$n \times 4 = 28$

$5 \times 35 = n$

$7 \times n = 42$

$4 \times 28 = n$

$5 \times 7 = n$

Using Multiplication

Complete. Your multiplication chart should help you.

3 × 5 = ______

5 × 6 = ______

2 × 9 = ______

3 × 6 = ______

7 × 4 = ______

3 × 8 = ______

4 × 2 = ______

5 × 10 = ______

7 × 10 = ______

100 × 8 = ______

100 × 6 = ______

______ × 4 = 12

______ × 3 = 6

______ × 2 = 10

______ × 6 = 18

______ × 4 = 20

______ × 7 = 21

______ × 1 = 9

______ × 10 = 20

______ × 100 = 100

______ × 5 = 500

______ × 9 = 900

Learning About Division

Finish these. Show an array for each problem.

(a) $8 \div 4 =$ ______ (b) $\frac{12}{4} =$ ______

(c) $15 \div 5 =$ ______ (d) $\frac{16}{4} =$ ______

(e) $32 \div 8 =$ ______ (f) $\frac{30}{6} =$ ______

Division.

Finish these. Show an array for each problem.

(g) $21 \div 7 =$ ______

(h) $27 \div 3 =$ ______

(i) $\frac{64}{8} =$ ______

(j) $\frac{81}{9} =$ ______

(k) $18 \div$ ______ $= 3$

(l) $\frac{24}{\underline{\quad}} = 6$

(m) ______ $\div 5 = 4$

(n) $\frac{\underline{\quad}}{6} = 5$

Division

Use arrays to help you if you need them.

10 ÷ 5 = ______

12 ÷ 3 = ______

16 ÷ 4 = ______

40 ÷ 5 = ______

32 ÷ 4 = ______

24 ÷ 3 = ______

45 ÷ 5 = ______

21 ÷ 3 = ______

12 ÷ 6 = ______

18 ÷ 3 = ______

56 ÷ 7 = ______

12 ÷ 4 = ______

27 ÷ 3 = ______

16 ÷ 8 = ______

54 ÷ 6 = ______

35 ÷ 7 = ______

28 ÷ 4 = ______

36 ÷ 4 = ______

49 ÷ 7 = ______

48 ÷ 8 = ______

81 ÷ 9 = ______

42 ÷ 6 = ______

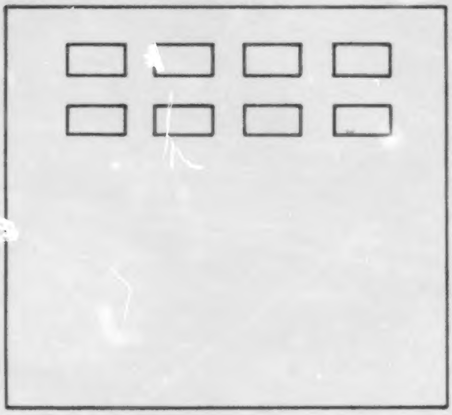
Learning to Divide

Bill had 24 tickets.

He put them in sets of 4.

How many sets of tickets did he have?

Finish this array to show how Bill could have separated the tickets.



How many sets of 4 would he have? ______

Now can you find the number of sets without the tickets?

24 ÷ 4 = ______

$$\begin{array}{r|l} 4\overline{)\,24} & \\ 16 & 4 \\ \hline 8 & \end{array}$$

4 sets of tickets will take 16 tickets.

There are 8 tickets left.

How many sets can he make now? ______

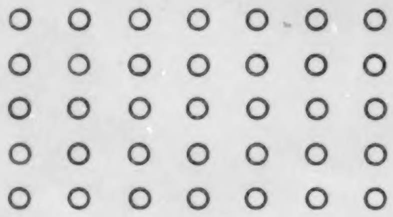
How many sets of tickets has he in all? ______

Are there any tickets left over? ______

Division

Complete: Use symbols or pictures. The first has been done for you using both.

1. $35 \div 7 =$ ______



$35 \div 7 = 5$

$$\begin{array}{r|l} 7)\,35 & \\ \underline{21} & 3 \\ 14 & \\ \underline{14} & \underline{2} \\ & 5 \end{array}$$

$35 \div 7 = 5$

2. $\frac{42}{6} =$ ______

3. $\frac{32}{8} =$ ______

4. $54 \div 9 =$ ______

5. $\frac{24}{3}$ = ______

6. 36 ÷ 4 = ______

7. $\frac{42}{7}$ = ______

8. 64 ÷ 8 = ______

9. $\frac{27}{3} =$ ______

10. $48 \div 8 =$ ______

11. $\frac{63}{7} =$ ______

12. $49 \div 7 =$ ______

Relation of Multiplication and Division

A. Multiplying by a number will undo dividing by the same number.

Think of 8.
Divide 8 by 2. $8 \div 2 = 4$
Then multiply 4 by 2. $2 \times 4 = 8$
The result is 8, the original number.
Multiplying by 2 undid dividing by 2.

B. Dividing by a number will undo multiplying by the same number.

Think of 8.
Multiply by 2. $2 \times 8 = 16$
Then divide 16 by 2. $16 \div 2 = 8$
The result is 8, the original number.

C. Fill the blanks to show doing and undoing.

The first example is done for you.

DO	UNDO
2 × 3 = 6	6 ÷ 2 = 3
4 × 5 = 20	20 ÷ _____ = _____
6 × 4 = _____	_____ ÷ 4 = _____
3 × 7 = _____	_____ ÷ 7 = _____
8 × 4 = _____	_____ ÷ 4 = _____
10 × 4 = _____	_____ ÷ 4 = _____
7 × 8 = _____	_____ ÷ 8 = _____
9 × 3 = _____	_____ ÷ 3 = _____
4 × 3 = _____	_____ ÷ 3 = _____
18 ÷ 3 = _____	3 × _____ = 18
64 ÷ 8 = _____	___ × ___ = ___
16 ÷ 4 = _____	_________________
42 ÷ 7 = _____	_________________
81 ÷ 9 = _____	_________________
24 ÷ 3 = _____	_________________
45 ÷ 5 = _____	_________________
36 ÷ 6 = _____	_________________

Multiplication Equations

Think of $45 \div n = 9$ as $n \times 9 = 45$.

Write the multiplication equation.

The first one has been done for you.

$21 \div n = 7$ $n \times 7 = 21$ $n = 3$	$16 \div n = 4$	$24 \div n = 4$
$40 \div n = 8$	$30 \div n = 6$	$25 \div n = 5$
$24 \div n = 8$	$16 \div n = 2$	$15 \div n = 5$
$28 \div n = 4$	$27 \div n = 9$	$12 \div n = 2$
$35 \div n = 7$	$20 \div n = 5$	$32 \div n = 8$

Division Equations

Think of $n \times 5 = 45$ as $45 \div 5 = 9$.

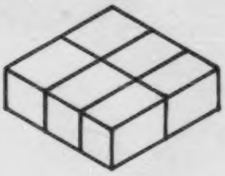
Write the division equation.

The first one has been done for you.

$n \times 4 = 24$ $24 \div 4 = \underline{\ \ 6\ \ }$	$n \times 7 = 21$	$n \times 9 = 45$
$n \times 6 = 18$	$n \times 7 = 42$	$n \times 9 = 63$
$n \times 8 = 56$	$n \times 9 = 72$	$n \times 9 = 27$
$n \times 7 = 21$	$n \times 3 = 24$	$n \times 7 = 49$
$n \times 9 = 36$	$n \times 9 = 18$	$n \times 4 = 16$
$n \times 6 = 36$	$n \times 9 = 54$	$n \times 8 = 48$
$n \times 8 = 40$	$n \times 8 = 64$	$n \times 9 = 81$

Multiplying Three Numbers

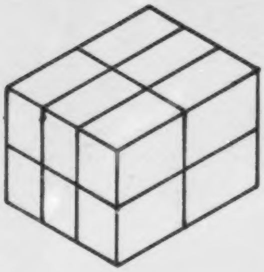
1.



Here is a picture of a set of blocks, arranged in 2 rows of 3 blocks. How many blocks are used? ______

2 × 3 = ______

2.



Here is a picture of a set of blocks arranged in 2 rows of 3 blocks and 2 layers. How many blocks were used in one layer? ______

2 × 3 = ______

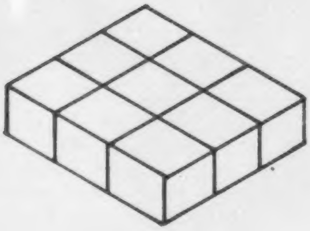
How many blocks were used in 2 layers?

n = (2 × 3) × 2

= 6 × 2

= ______

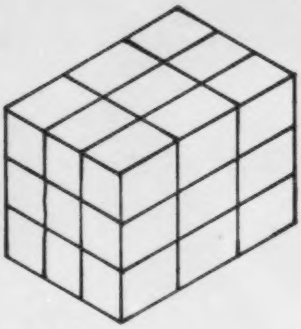
3.



Here is a picture of a set of blocks with ______ rows and ______ blocks in each row. There are 9 blocks in the picture.

______ × ______ = 9

4.



Here is a picture of a set of blocks with 3 rows of 3 blocks and 3 layers. How many blocks were used?

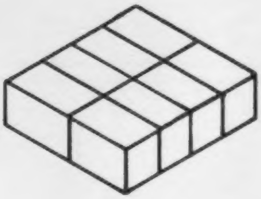
$n = 3 \times 3 \times 3$

$= (3 \times 3) \times 3$

$= \quad 9 \quad \times 3$

$= \underline{\qquad\qquad}$

5.

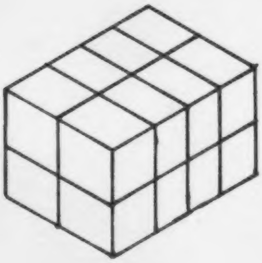


Here is a picture of a set of blocks with _____ rows and _____ blocks in each row. The equation that tells us the number of blocks is:

$\underline{\qquad} \times \underline{\qquad} = \underline{\qquad}.$

6.

There are ______ layers of blocks. In each layer there are 2 rows of ______ blocks. In the picture there are ______ blocks.



$n = 2 \times (2 \times 4)$

$= 2 \times \underline{\qquad}$

$= \underline{\qquad\qquad}$

What would you find for the product if you write:

$(2 \times 2) \times 4 = \underline{\quad} \times \underline{\quad} = \underline{\quad}$

Are your products the same?

Multiplication

Example: $2 \times 3 \times 4 = (2 \times 3) \times 4$
$= 6 \times 4$
$= 24$

OR

$2 \times 3 \times 4 = 2 \times (3 \times 4)$
$= 2 \times 12$
$= 24$

First multiply the factors in parentheses ( ).

Did you get the same product?

Why?

Find these products:

1. $3 \times 3 \times 2$

$3 \times 3 \times 2 = (3 \times 3) \times 2$
= ______ $\times 2$
= _____

$3 \times 3 \times 2 = 3 \times (3 \times 2)$
$= 3 \times$ ______
= _____

2. $2 \times 4 \times 5$

$2 \times 4 \times 5 = (2 \times 4) \times 5$
= ______ $\times 5$
= _____

$2 \times 4 \times 5 = 2 \times (4 \times 5)$
$= 2 \times$ ______
= _____

3. Find the product of 4, 2, and 3 in two ways.

4 × 2 × 3 = (4 × 2) × 3
= _____ × 3
= _____

4 × 2 × 3 = 4 × (2 × 3)
= 4 × _____
= _____

4. Find the product of 2, 4, and 5 in two ways.

2 × 4 × 5 = (2 × 4) × 5
= _____ × 5
= _____

2 × 4 ×   = 2 × (4 ×)
= 2 × _____
= _____

5. Find the product of 5, 2, and 3 in two ways.

5 × 2 × 3 = (___ × ___) × ___
= ____ × ____
= _____

5 × 2 × 3 = ___ × (___ × ___)
= ____ × ____
= _____

6. Find the product of 2, 5, and 4 in two ways.

2 × 5 × 4 = (___ × ___) × ___
= ____ × ____
= _____

2 × 5 × 4 = ___ × (___ × ___)
= ____ × ____
= _____

Multiplying with Multiples of 10

Multiply:

45 × 10 = -----
10 × 35 = -----
72 × 10 = -----
12 × 10 = -----
7 × 10 = -----
9 × 10 = -----
10 × 50 = -----
10 × 39 = -----
4 × 100 = -----
6 × 200 = -----
3 × 600 = -----
6 × 10 = -----
10 × 84 = -----
3 × 10 = -----
24 × 10 = -----
18 × 10 = -----
37 × 10 = -----

17 × 10 = -----
10 × 72 = -----
100 × 7 = -----
5 × 800 = -----
400 × 3 = -----
27 × 10 = -----
64 × 10 = -----
10 × 53 = -----
10 × 47 = -----
68 × 10 = -----
6 × 10 = -----
8 × 10 = -----
10 × 11 = -----
2 × 500 = -----
7 × 400 = -----
100 × 8 = -----
50 × 20 = ----

A Chart

Directions: Fill in the chart with the products for the numbers in the rows and the columns.

Example: 8 × 30 = 240

You may think about 8 × 30 = 8 × (3 × 10)

= (8 × 3) × 10

= 24 × 10

= 240

×	10	20	30	50	90	80	60	70	40
1									
2									
3									
5									
8			240						
4									
6									
9									
7									

Using the Associative Property for Multiplication

Multiply:

1) $3 \times 20 = 3 \times (2 \times 10)$
$= (3 \times 2) \times 10$
$= 6 \times 10$
$= 60$

2) 5 × 70 = ___ × (___ × ___)
= (___ × ___) × ___
= ___ × ___
= ___

3) 4 × 20 =

4) 3 × 40 =

5) 5 × 90 =

6) 7 × 40 =

7) 70 × 3 = 10 × 7 × 3

= 10 × (7 × 3)

= 10 × 21

= 210

8) 50 × 9 = (___ × ___) × ___

= ___ × (___ × ___)

= ___ × ___

= ___

9) 60 × 4 =

10) 80 × 2 =

11) 600 × 3 = (100 × 6) × 3

= 100 × (6 × 3)

= 100 × ______

= ______

12) 900 × 4 =

13) 400 × 8 =

14) 300 × 6 =

Multiples of Ten

70 ÷ 7 = ---

70 ÷ 10 = ---

140 ÷ 7 = ---

60 ÷ 6 = ---

120 ÷ 6 = ---

60 ÷ 10 = ---

20 ÷ 2 = ---

40 ÷ 2 = ---

60 ÷ 2 = ---

20 ÷ 10 = ---

40 ÷ 10 = ---

$\frac{80}{8}$ = ---

$\frac{80}{10}$ = ---

$\frac{160}{8}$ = ---

$\frac{50}{5}$ = ---

$\frac{100}{5}$ = ---

$\frac{60}{10}$ = ---

$\frac{20}{10}$ = ---

$\frac{30}{10}$ = ---

$\frac{40}{4}$ = ---

$\frac{150}{10}$ = ---

$\frac{100}{10}$ = ---

40 ÷ 10 = ---

80 ÷ 4 = ---

90 ÷ 9 = ---

$\frac{180}{9}$ = ---

90 ÷ 9 = ---

$\frac{30}{3}$ = ---

130 ÷ 10 = ---

120 ÷ 10 = ---

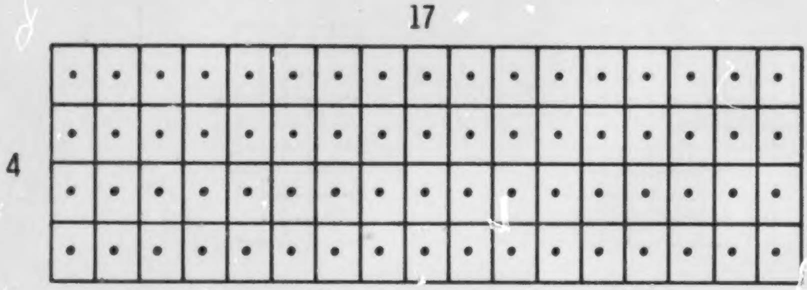
$\frac{160}{10}$ = ---

140 ÷ 10 = ---

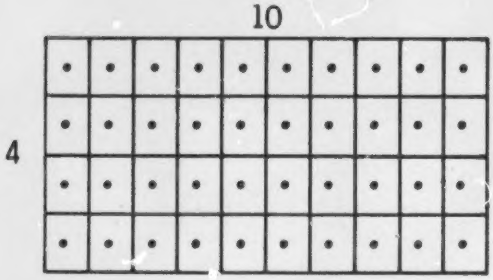
190 ÷ 10 = ---

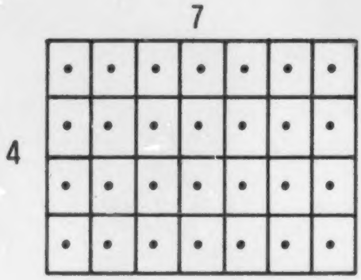
The Distributive Property

1. To find the product for $4 \times 17 = n$, think of a 4 by 17 array.



Then think about separating this array into two smaller arrays.





Find the number of members in each array.

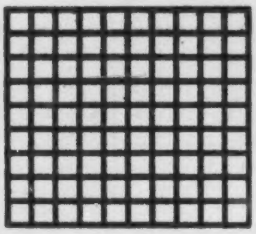
Then add these numbers to find the number of members in the 4×17 array.

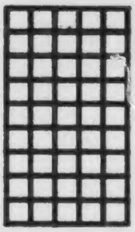
We write:

$$\begin{array}{r} 17 \\ \times\ 4 \\ \hline \end{array} \qquad\qquad \begin{array}{r} 10 + 7 \\ \times\ 4 \\ \hline 40 + 28 = 68 \end{array}$$

The number of members in a 9 by 10 array is 9 × 10 = ______

The number of members in a 9 by 5 array is 9 × 5 = ______

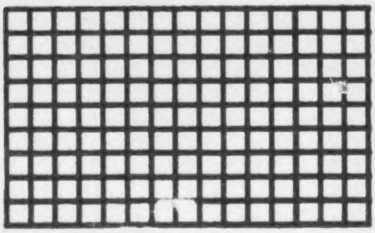




The number of members in a 9 by 15 array is 9 × 15 = ______

$$\begin{array}{r} 15 \\ \times 9 \\ \hline \end{array} \qquad \begin{array}{r} 10 + 5 \\ \times 9 \\ \hline \end{array}$$

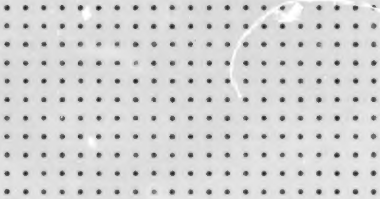
___ + ___ = ___



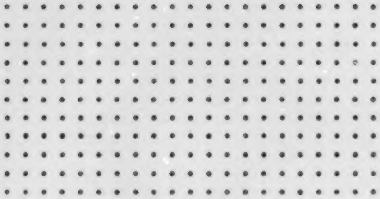
Using Arrays

Find the products: **Show the array:**

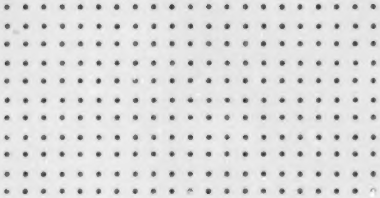
1. 3 × 15 = ______



2. 6 × 17 = ______



3. 5 × 18 = ______



Multiplication

Try these. Use arrays to help you if you need them.

1. $\begin{array}{r}17\\ \times 2\\ \hline\end{array}$

2. $\begin{array}{r}15\\ \times 4\\ \hline\end{array}$

3. $\begin{array}{r}18\\ \times 3\\ \hline\end{array}$

4. $\begin{array}{r}17\\ \times 6\\ \hline\end{array}$

5. $\begin{array}{r}19\\ \times 5\\ \hline\end{array}$

6. $\begin{array}{r}13\\ \times 9\\ \hline\end{array}$

7. $\begin{array}{r}12\\ \times 4\\ \hline\end{array}$

8. $\begin{array}{r}17\\ \times 3\\ \hline\end{array}$

Solving Problems

Use your own paper. Write the number of the problem.

Write the equations and the sentence that tells the answer.

At the Candy Store

1. Judy bought 6 chocolate bars. Each bar cost 6¢. Find how much Judy's candy bars cost.

2. Sue brought 2 friends with her. She bought 3 bars of baking chocolate for Mother. Each bar cost 18¢. How much did Mother's baking chocolate cost?

3. Bob spent 25¢ for ice cream bars. Each bar cost 5¢. How many ice cream bars did he buy?

4. Ellen bought 6 lemon drops and 8 orange drops. How many orange and lemon drops did Ellen buy?

5. Jane spent 47¢ for gum and stick candy. She bought 5 packages of gum at 5¢ a package and spent the rest for candy at 2¢ a stick. How many sticks of candy did Jane buy?

Solving Problems

Use your own paper. Write the number of the problem.
Write the equations and the sentence that tells the answer.

1. Billy had 45¢. He wanted to buy as many 5¢ stamps as he could. How many 5¢ stamps could he buy?

2. Jeff went in the house to get cookies for his 2 friends and himself. He thought he had 9 cookies but when he got outside and counted them he had 10 cookies. How many cookies should he give to each person?

3. Kelly had 56 new stamps to paste in his stamp book. Each row in the book has 8 stamps. How many rows of stamps can he paste in the book?

4. Mother bought 4 pencils at 5¢ each. Ann wanted pencils but she didn't like the ones Mother bought so she bought 4 of a different kind. How much did Ann's pencils cost?

5. Father gave Brad 8 golf balls. Two of them had red marks and the rest were marked with green marks. Mother said, "I have 3 golf balls marked with green. You may have them to put with your green ones." How many golf balls marked with green does Brad have?

Solving Problems

Use your own paper. Write the number of the problem.
Write the equations and the sentence that tells the answer.

1. John had 50¢. He bought 3 rolls at 7¢ for each roll. How much money did he have then?

2. Mary bought five 5¢ stamps and six 4¢ stamps. How much did Mary pay for the stamps?

3. John decided to save nickels. One day he counted his collection and found that he had 9 nickels. How many cents did John have in all?

4. Susan spent 12¢ for doll dresses and 5¢ for doll shoes. How much change would Susan get if she gave the clerk a quarter to pay for the doll things?

5. Molly bought a story book for 15¢, a pencil for 5¢, writing paper for 10¢, a doll hat for 10¢, and an eraser for 3¢. How much did Molly spend for writing materials?

6. David bought 4 kites. Each kite cost exactly the same as the other kites. If David spent 40¢ for the kites, how much did each kite cost?

Solving Problems

Use your own paper. Write the number of the problem.

Write the equations and the sentence that tells the answer.

1. When Mother cleaned house she washed all of her good dishes. She had 3 sets of dishes and each set had 48 pieces. How many dishes did Mother wash?

2. Father and Bill helped wash the dishes. It usually took them 30 minutes. Father helped Mother for 20 minutes. How long did Bill work alone with Mother?

3. Mother's cupboards were small so she had to put the 3 sets of dishes in 4 cupboards. If she put the same number of dishes in each cupboard, how many dishes did Mother put in each cupboard?

4. Mother also washed the windows. There were 4 panes of glass in each of the 14 windows Mother washed. How many panes of glass did she wash?

5. It took 10 minutes to wash each window. How long did it take to wash the 14 windows?

Solving Problems

Use your own paper. Write the number of the problem.

Write the equation and the sentence that tells the answer.

1. Mother made 8 aprons. She gave 4 aprons away. After she made more aprons she had 7 aprons. Find how many more aprons Mother made.

2. Jim's team made 3 points in each inning of the game. Find how many points they made in 6 innings.

3. Jack had 32 pieces of candy to give to 4 children. Two of the children were girls. If he gave the same number of pieces to each child, how many pieces did each child get?

4. Sally had 7 stuffed toys. Only 3 of the toys were animals. For her birthday Sally got 5 stuffed toys. Two of them were stuffed dolls and the rest were stuffed animals. Then how many stuffed animals did Sally have?

5. Three children had birthdays. One cake had 6 candles and another cake had 5 candles. Altogether there were 17 candles. Find how many candles were on the third birthday cake.

Solving Problems

Use your own paper. Write the number of the problem.
Write the equations and the sentence that tells the answer.

1. Jean invited 13 girls to her birthday party. She wanted to give each girl 3 balloons. How many balloons did she buy?

2. For one of the games Jean wanted to give each of the girls 8 toothpicks. How many toothpicks did Jean need?

3. Jean's mother made party favors for all of the girls including Jean. Mother needed 4 sticks of gum and 3 gumdrops for each favor. Find how many sticks of gum she had to buy.

4. When Jean opened her gifts she found 2 books and 3 boxes of candy. Each box of candy had 18 pieces. How many pieces of candy were in all of the boxes together?

5. Mother set 3 tables with 5 places at each table. Were there enough places for all of the girls and Mother to be seated?

6. If Mother used 5 dishes at each place on the tables, how many dishes did she need for all of the places?

Solving Problems

Use your own paper. Write the number of the problem.
Write the equations and the sentence that tells the answer.

1. Mother bought a large bag of jacks for Beth, Susan and Peggy. On the bag the girls could read, "60 Jacks." Mother gave all of the jacks to the girls. If each girl got the same number of jacks, how many jacks will each girl get?

2. Mary helped Mother by setting the table for 3 meals every day. How many times did she set the table in a week?

3. Jack bought 7 packages of bulbs for his garden. On the outside of 3 packages he read "12 Bulbs." On 4 of the packages he read "10 Bulbs." How many bulbs did Jack buy?

4. Mother gave Beth 5 new hair bows and 7 pairs of socks. Grandmother gave Beth six hair bows and another pair of socks. How many hair bows does Beth have now?

5. Grandmother had 36 prunes in a bowl. She said to Susan, "Please put all of these into 4 dishes. Be sure to put the same number of prunes in each dish." How many prunes did Susan put in each dish?

Solving Problems

Use your own paper. Write the number of the problem.

Write the equations and the sentence that tells the answer.

1. Miss Jones brought 3 boxes of chalk and 7 boxes of pencils from the office. Each box held 12 pencils. How many pencils did Miss Jones bring from the office?

2. Miss Briggs needed chairs for 56 children in the auditorium. Mr. Peterson set up 5 rows of chairs with 12 chairs in each row. How many empty chairs will there be?

3. Miss Stone's class was going on a field trip. The children rode in 4 station wagons. Eight children rode in each wagon. Find how many children went on the field trip.

4. Mrs. Smith asked John to get enough pencils so that each of the 23 children would have 4 pencils. Find how many pencils John must get.

5. Miss Kent brought fruit drink for the party. If she could pour 5 glasses full from each bottle, how many glasses could she fill from 7 bottles?

6. There are 5 classrooms on the first floor of Humbert School and 4 classrooms on the second floor. How many children are in the classrooms on the second floor if each classroom has 31 children in it?

★ Factors and Clock Wheels

1. Write these numbers as products of prime numbers. The first two are done for you.

6 = 2 × 3
18 = 2 × 3 × 3
10 = ____________
14 = ____________
9 = ____________

4 = ____________
8 = ____________
7 = ____________
30 = ____________
100 = ____________

2. We say that 10 and 14 have the common factor 2 since 2 is a factor of both 10 and 14. What common factor do 6 and 9 have? ________ (Since 1 is always a common factor, there is no need to mention it.) Look up above at the factors of 18 and 30. What common factors do 18 and 30 have? ________ The greatest common factor of 18 and 30 is 2 × 3 or 6.

3. Find the greatest common factor of each pair of numbers:

14 = 2 × 7
21 = 3 × 7
Greatest common factor: 7

35 = 5 × 7
20 = 2 × 2 × 5
Greatest common factor: ________

12 = 2 × 2 × 3
9 = 3 × 3
Greatest common factor: ________

10 = ________
15 = ________
Greatest common factor: ________

9 = ________
8 = ________
Greatest common factor: ________

4. Find the greatest common factor of each pair of numbers:

7 = ________
21 = ________
Greatest common factor: ________

20 = ________
9 = ________
Greatest common factor: ________

20 = 2 × 2 × 5
28 = 2 × 2 × 7
Greatest common factor: 2 × 2 = 4

12 = ________
18 = ________
Greatest common factor: ________

30 = ________
40 = ________
Greatest common factor: ________

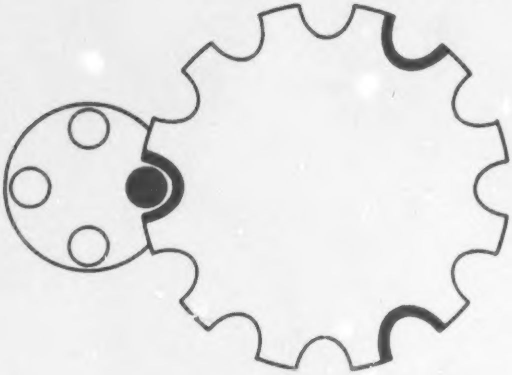
16 = ________
26 = ________
Greatest common factor: ________

44 = ________
20 = ________
Greatest common factor: ________

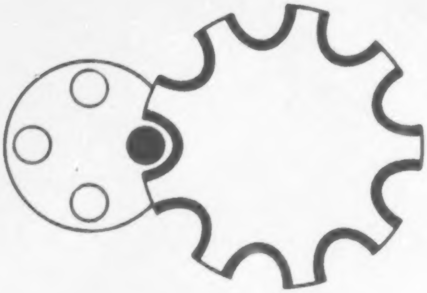
12 = ________
25 = ________
Greatest common factor: ________

33 = ________
6 = ________
Greatest common factor: ________

5. Here is a pair of wheels from an old clock. Imagine them turning. Outline with a black crayon all the notches on wheel B which are touched by the black peg.

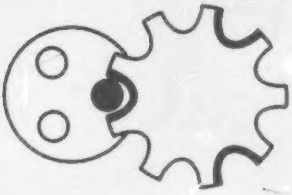


In the picture below, the big wheel has 9 notches instead of 12. Again, outline in black the notches touched by the black peg.

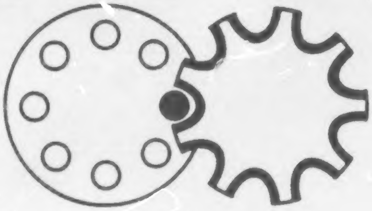


Can you explain why the black peg touched only 3 notches in the first case, but touched all 9 in the second case? The examples on the next page may help.

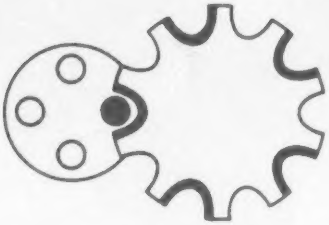
6. Fill in the number of notches and the number of pegs. Then outline in black the notches touched by the black peg as the wheels turn.



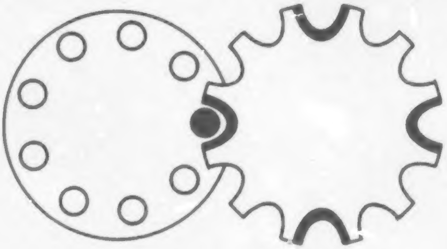
____ pegs, ____ notches



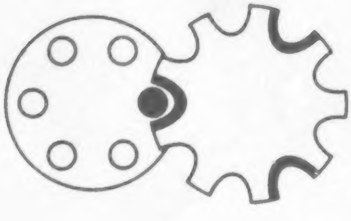
____ pegs, ____ notches



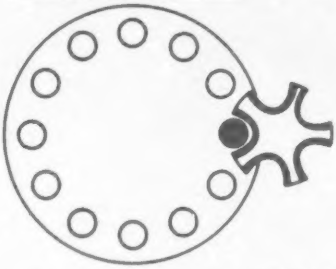
____ pegs, ____ notches



____ pegs, ____ notches



____ pegs, ____ notches



____ pegs, ____ notches

Now look at what you have done. Can you think of a rule to tell you when the black peg will touch all the notches and when it won't? (Think about common factors.)

7. Now try some without pictures. Mark with X those examples in which the black peg would touch all the notches.

3 pegs, 5 notches ____

6 pegs, 12 notches ____

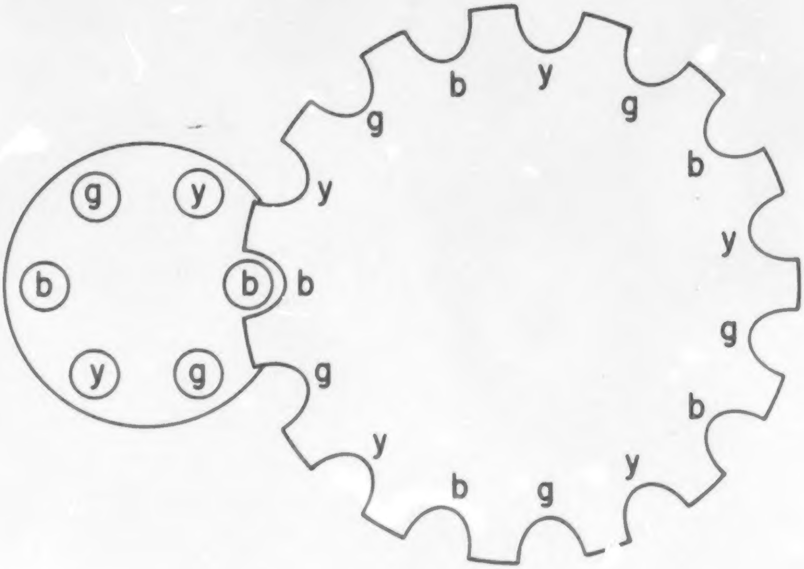
7 pegs, 11 notches ____

6 pegs, 14 notches ____

9 pegs, 24 notches ____

15 pegs, 16 notches ____

8. In this picture color the pegs and notches in such a way that no peg of one color ever touches a notch of another color. Use as many different colors as you can.



Number of pegs: ______

Number of notches: ______

Greatest common factor of these numbers: ______

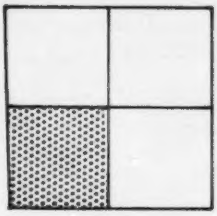
Number of different colors: ______

Now color all the wheels on the pages you did before in the same way that you colored these.

9. Suppose wheel A has 28 pegs of which one is black, and wheel B has 100 notches. How many notches does the black peg touch as the wheels turn? ________ What is the greatest number of different colors you could use to color the pegs and notches so that no peg ever touches a notch of a different color? _______ How many pegs would you have of each color? ________ How many notches would you have of each color? ________ Don't try to draw a picture; just work with the numbers.

Rational Numbers

Ring the fraction that tells what part is shaded.

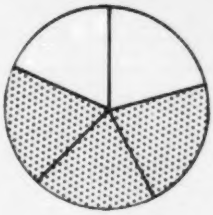


$\frac{3}{4}$

$\frac{2}{4}$

$\frac{1}{4}$

$\frac{4}{1}$

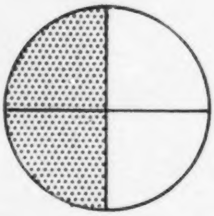


$\frac{3}{5}$

$\frac{5}{3}$

$\frac{2}{5}$

$\frac{5}{5}$

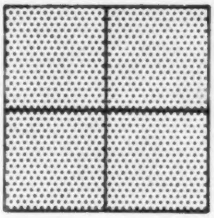


$\frac{3}{5}$

$\frac{2}{4}$

$\frac{4}{2}$

$\frac{1}{3}$

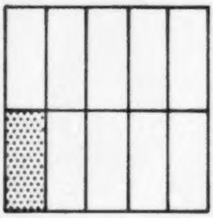


$\frac{1}{4}$

$\frac{4}{4}$

$\frac{3}{4}$

$\frac{2}{4}$

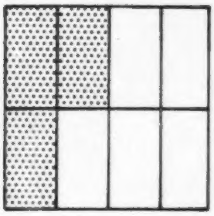


$\frac{1}{10}$

$\frac{10}{1}$

$\frac{1}{5}$

$\frac{1}{3}$



$\frac{5}{8}$

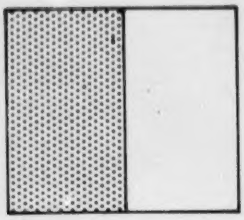
$\frac{3}{8}$

$\frac{1}{4}$

$\frac{3}{4}$

Rational Numbers

Ring the fraction that tells what part is shaded.

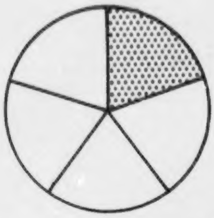


$\frac{1}{3}$

$\frac{1}{2}$

$\frac{2}{1}$

$\frac{2}{2}$

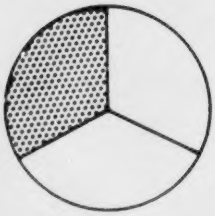


$\frac{5}{1}$

$\frac{1}{5}$

$\frac{4}{5}$

$\frac{2}{5}$

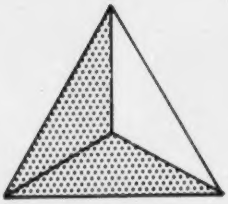


$\frac{2}{3}$

$\frac{1}{3}$

$\frac{3}{1}$

$\frac{1}{2}$

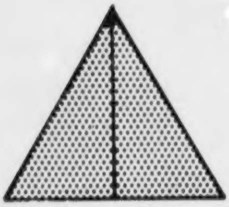


$\frac{1}{3}$

$\frac{2}{3}$

$\frac{3}{2}$

$\frac{3}{3}$

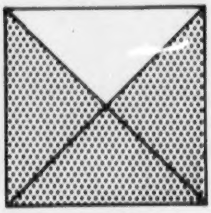


$\frac{1}{2}$

$\frac{1}{4}$

$\frac{2}{2}$

$\frac{2}{4}$



$\frac{1}{4}$

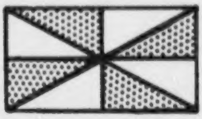
$\frac{4}{3}$

$\frac{3}{4}$

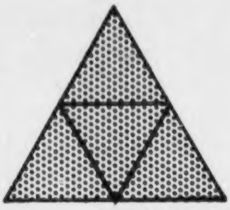
$\frac{2}{3}$

Rational Numbers

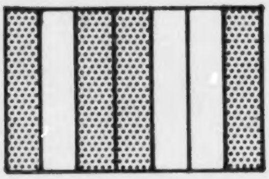
Complete the chart.



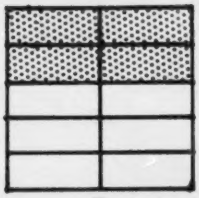
A



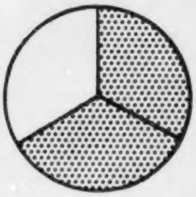
B



C



E



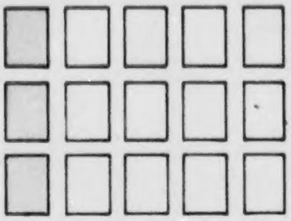
D

Figure	Parts Shaded	Congruent Parts of Unit	Name of Number of the Shaded Area
A			
B			
C			
D			
E			

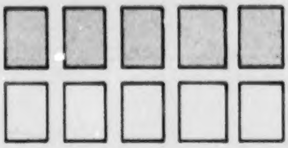
Rational Numbers and Sets of Objects

Name the rational number suggested by shaded objects in each set.

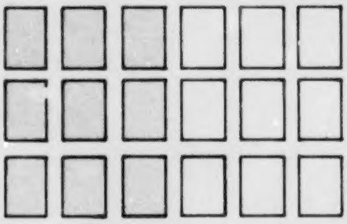
1.



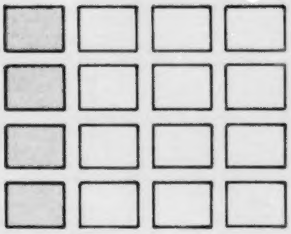
2.



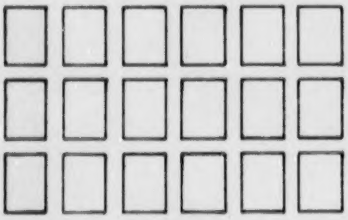
3.



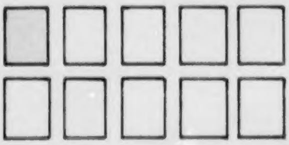
4.



5.

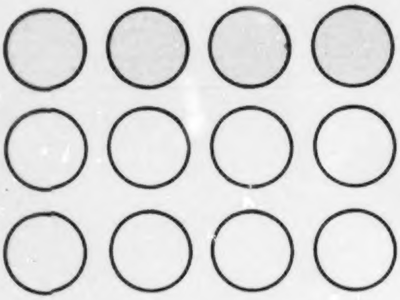


6.



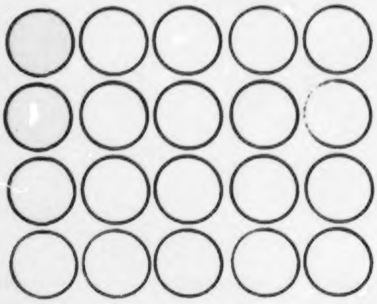
Rational Numbers and Sets of Objects

Complete the sentences.



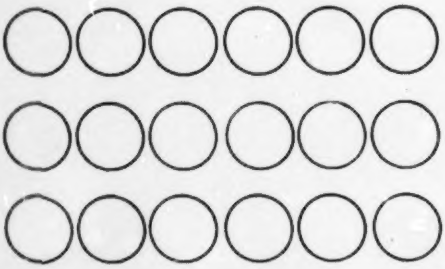
_______ of 12 = 4

12 = 3 × _______



_______ of 20 = 4

20 = 4 × _______

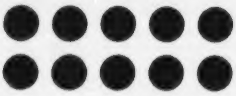


_______ of 18 = 6

18 = _______ × 6

Rational Numbers

Complete:



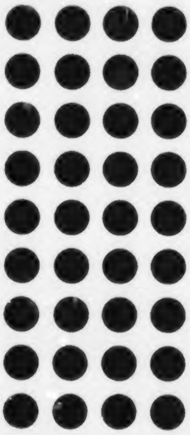
10 = ____ × 5

$\frac{1}{2}$ of 10 = ____

$\frac{1}{5}$ of 10 = ____

$\frac{3}{5}$ of 10 = ____

$\frac{5}{5}$ of 10 = ____



36 = ____ × 4

$\frac{1}{9}$ of 36 = ____

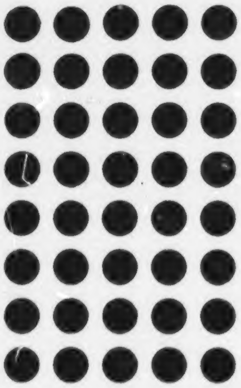
$\frac{3}{9}$ of 36 = ____

$\frac{5}{9}$ of 36 = ____

$\frac{7}{9}$ of 36 = ____

Rational Numbers

Complete:



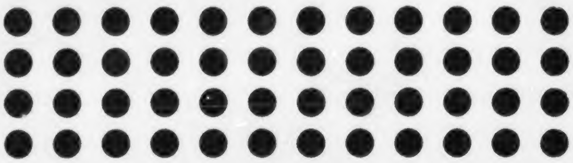
40 = ____ × 5

$\frac{1}{8}$ of 40 = ____

$\frac{3}{8}$ of 40 = ____

$\frac{6}{8}$ of 40 = ____

$\frac{8}{8}$ of 40 = ____



48 = ____ × 12

$\frac{1}{4}$ of 48 = ____

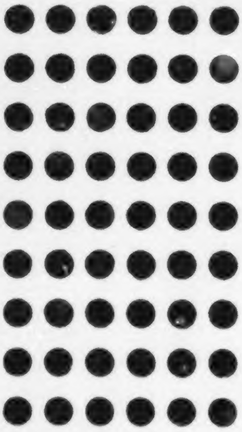
$\frac{1}{12}$ of 48 = ____

$\frac{1}{2}$ of 48 = ____

$\frac{12}{12}$ of 48 = ____

Rational Numbers

Complete:



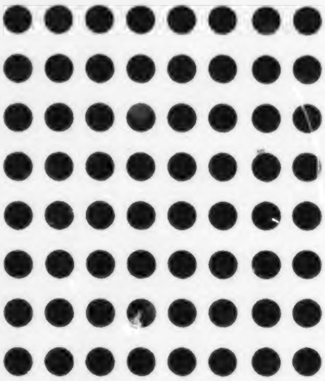
$54 = \_\_\_ \times 6$

$\frac{1}{9}$ of 54 is ___

$\frac{1}{6}$ of 54 is ___

$\frac{6}{6}$ of 54 is ___

$\frac{9}{9}$ of 54 is ___



$64 = \_\_\_ \times 8$

$\frac{1}{8}$ of 64 is ___

$\frac{3}{8}$ of 64 is ___

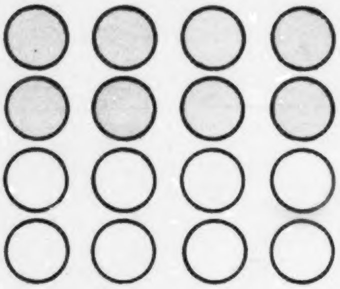
$\frac{4}{8}$ of 64 is ___

$\frac{5}{8}$ of 64 is ___

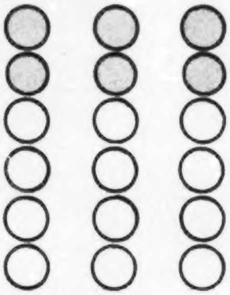
$\frac{8}{8}$ of 64 is ___

Rational Numbers and Sets of Objects

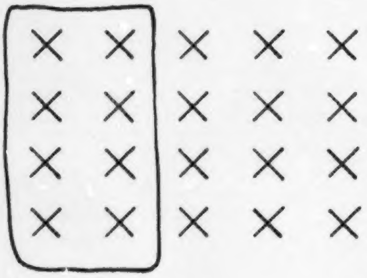
Complete:



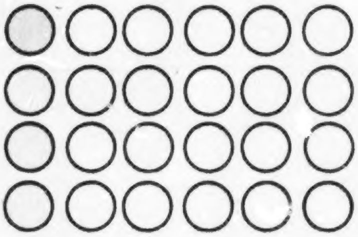
8 is ___ of ___.



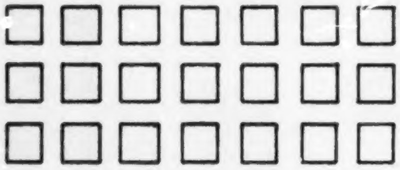
6 is ___ of ___.



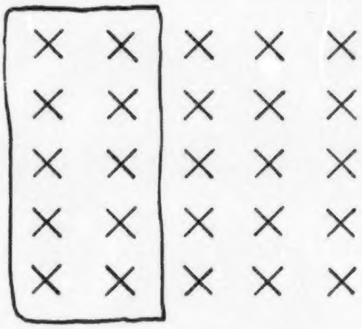
8 is ___ of ___.



4 is ___ of ___.



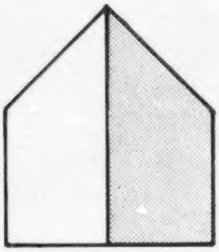
6 is ___ of ___.

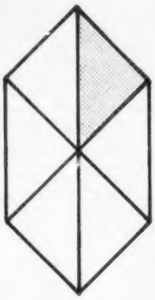


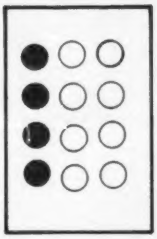
10 is ___ of ___.

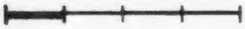
Rational Numbers -- Review

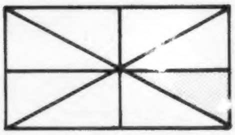
For each figure, write a fraction which names the rational number suggested by the shaded part of the picture.

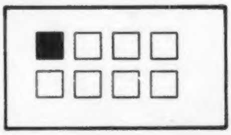






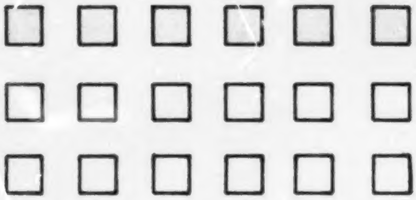




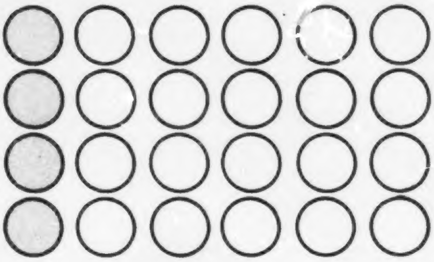


Rational Numbers and Sets of Objects

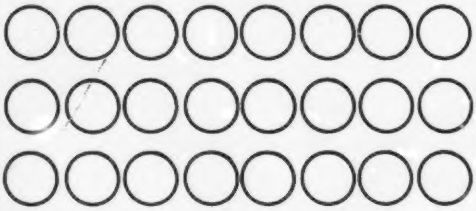
Complete:



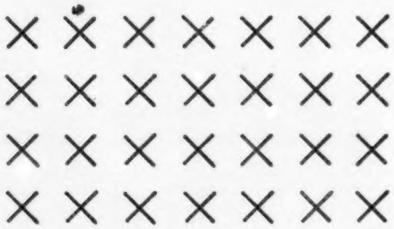
6 is ___ of ___.
3 is ___ of ___.
9 is ___ of ___.



4 is ___ of ___.
6 is ___ of ___.
12 is ___ of ___.



3 is ___ of ___.
8 is ___ of ___.
21 is ___ of ___.

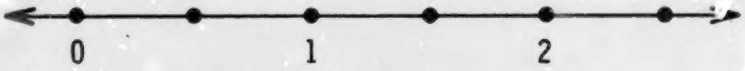


7 is ___ of ___.
4 is ___ of ___.
14 is ___ of ___.
28 is ___ of ___.

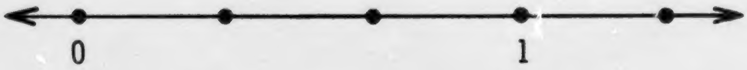
Rational Numbers Describe Points On Number Line.

Label each point marked, using a rational number.

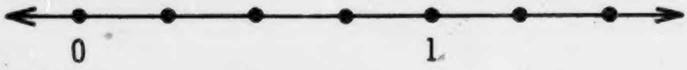
A.



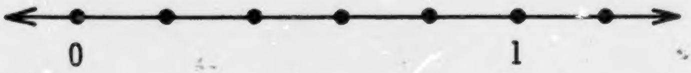
B.



C.



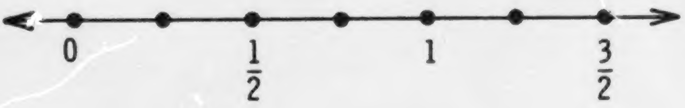
D.



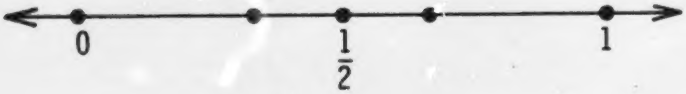
Rational Numbers Describe Points On Number Line.

Label each point marked, using a rational number.

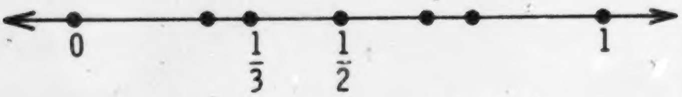
A.



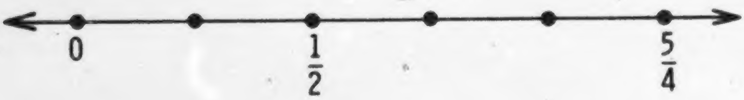
B.



C.



D.

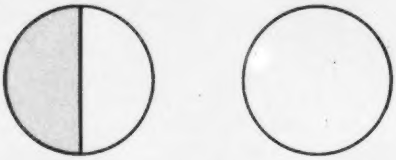


Order Among Rational Numbers

Name the rational number suggested by each shaded region.

Then complete the sentence.

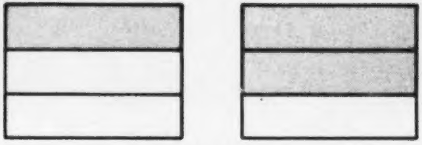
A.



_____ _____

_____ < _____

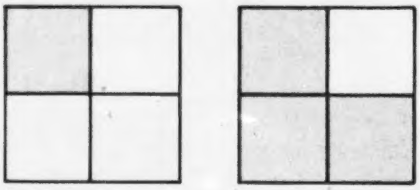
B.



_____ _____

_____ > _____

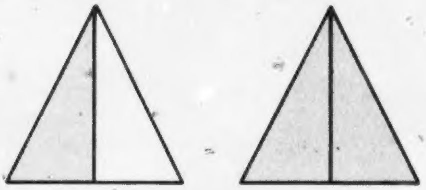
C.



_____ _____

_____ > _____

D.



_____ _____

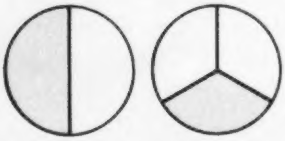
_____ < _____

Order Among Rational Numbers

Name the rational number suggested by each shaded region.

Then complete the sentence.

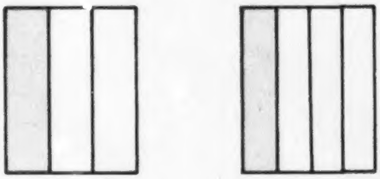
E.



_____ _____

_____ < _____

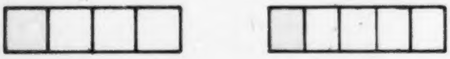
F.



_____ _____

_____ > _____

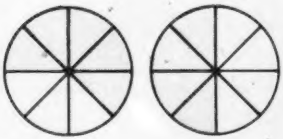
G.



_____ _____

_____ > _____

H.



_____ _____

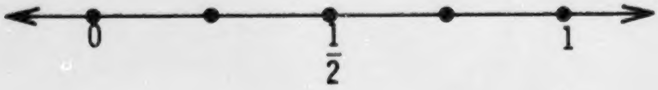
_____ < _____

Order Among Rational Numbers

Label each point using a rational number name.

Then complete each sentence using >, <, or =.

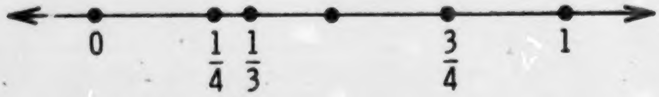
A.



$\frac{1}{4}$ ________ $\frac{1}{2}$

$\frac{1}{4}$ ________ 0

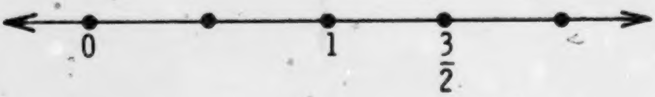
B.


0
$\frac{1}{4}$
$\frac{1}{3}$
$\frac{3}{4}$
1

$\frac{3}{4}$ ________ $\frac{1}{3}$

$\frac{2}{4}$ ________ $\frac{1}{2}$

C.



$\frac{3}{2}$ ________ 1

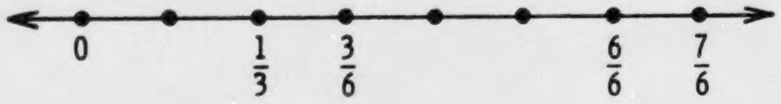
$\frac{1}{2}$ ________ $\frac{3}{2}$

Order Among Rational Numbers

Label each point using a rational number name.

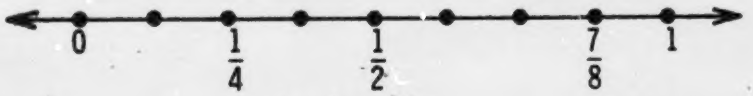
Then complete each sentence using >, <, or =.

D.



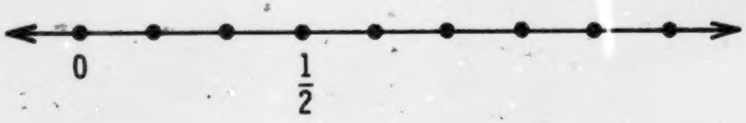
$\frac{3}{6}$ ________ $\frac{6}{6}$ $\qquad$ $\frac{4}{6}$ ________ $\frac{2}{6}$

E.



$\frac{7}{8}$ ________ $\frac{8}{8}$ $\qquad$ $\frac{1}{2}$ ________ $\frac{4}{8}$ $\qquad$ $\frac{2}{4}$ ________ $\frac{1}{2}$

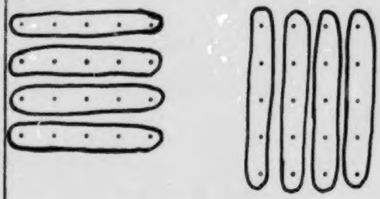
F.



$\frac{1}{2}$ ________ $\frac{3}{6}$ $\qquad$ $\frac{1}{3}$ ________ $\frac{2}{6}$ $\qquad$ $\frac{1}{2}$ ________ $\frac{1}{3}$

Using Arrays to Show Division

The first exercise has been done for you.



20 ÷ 4 = 5

12 ÷ 3 = ______

15 ÷ 3 = ______

$\frac{21}{3}$ = ______

$\frac{32}{8}$ = ______

16 ÷ 8 = ______

18 ÷ 3 = ______

30 ÷ 5 = ______

Solving Equations

The first one has been done for you.

$n \times 9 = 36$ $n = \frac{36}{9}$ $n = 4$	$7 \times n = 56$ $n =$ ______ $n =$ ______
$5 \times n = 45$ $n = \frac{45}{5}$ $n =$ ______	$n \times 6 = 54$ $n =$ ______ $n =$ ______
$6 \times n = 42$ $n =$ ______ $n =$ ______	$n \times 4 = 16$ $n =$ ______ $n =$ ______
$7 \times n = 49$ $n =$ ______ $n =$ ______	$n \times 5 = 35$ $n =$ ______ $n =$ ______
$4 \times n = 28$ $n =$ ______ $n =$ ______	$8 \times n = 24$ $n =$ ______ $n =$ ______

Two Ways of Writing a Division Example

The first example in each column has been done for you.

$35 \div 7 = \frac{35}{7} = 5$

$42 \div 6 =$ ______ = ______

$81 \div 9 =$ ______ = ______

$45 \div 5 =$ ______ = ______

$72 \div 8 =$ ______ = ______

$40 \div 5 =$ ______ = ______

$63 \div 9 =$ ______ = ______

$24 \div 6 =$ ______ = ______

$56 \div 7 =$ ______ = ______

$\frac{18}{2} = 18 \div 2 = 9$

$\frac{27}{3} =$ ____ ÷ ____ = ____

$\frac{32}{4} =$ ____ ÷ ____ = ____

$\frac{32}{8} =$ ____ ÷ ____ = ____

$\frac{30}{5} =$ ____ ÷ ____ = ____

$\frac{49}{7} =$ ____ ÷ ____ = ____

$\frac{28}{4} =$ ____ ÷ ____ = ____

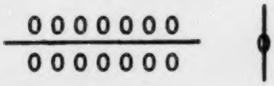
$\frac{18}{3} =$ ____ ÷ ____ = ____

$\frac{36}{4} =$ ____ ÷ ____ = ____

Fair Shares

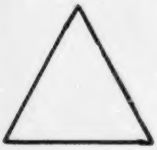
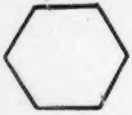
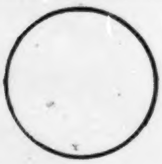
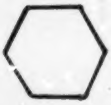
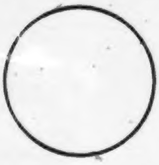
Show your partition. Work the example.

The first one has been done for you.

$\frac{1}{2}$ of $15 = \frac{15}{2} = 7 + \frac{1}{2} = 7\frac{1}{2}$ 
$\frac{1}{3}$ of 16
$\frac{1}{4}$ of 13
$\frac{1}{5}$ of 21
$\frac{1}{6}$ of 19
$\frac{1}{7}$ of 22
$\frac{1}{8}$ of 25
$\frac{1}{9}$ of 28

Fractions

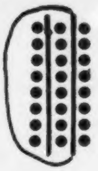
Divide the region into congruent parts. Shade the part that represents the fraction.

	$\frac{1}{5}$		$\frac{1}{4}$
	$\frac{1}{2}$		$\frac{1}{6}$
	$\frac{1}{8}$		$\frac{1}{3}$
	$\frac{3}{4}$		$\frac{5}{6}$
	$\frac{2}{8}$		$\frac{3}{8}$

Finding the Number That Names Part of a Set

Work each example. Make an array to show that your answer is correct. The first one has been done for you.

1) $\frac{2}{3}$ of 24



$\frac{1}{3}$ of 24 = $\frac{24}{3}$ = 8

2 × 8 = 16

$\frac{2}{3}$ of 24 = 16

2) $\frac{3}{5}$ of 25

3) $\frac{4}{9}$ of 36

4) $\frac{5}{7}$ of 21

5) $\frac{3}{4}$ of 16

6) $\frac{5}{8}$ of 24

7) $\frac{2}{3}$ of 27	8) $\frac{5}{7}$ of 35
9) $\frac{5}{6}$ of 18	10) $\frac{3}{8}$ of 16

11) Use the symbols >, < or = to make these true statements.

$\frac{3}{4}$ of 12 _____ $\frac{2}{3}$ of 12

$\frac{2}{3}$ of 15 _____ $\frac{5}{6}$ of 12

$\frac{5}{8}$ of 16 _____ $\frac{4}{9}$ of 18

$\frac{8}{9}$ of 27 _____ $\frac{5}{6}$ of 24

$\frac{2}{9}$ of 45 _____ $\frac{2}{5}$ of 30

$\frac{3}{8}$ of 48 _____ $\frac{4}{7}$ of 42

$\frac{5}{9}$ of 63 _____ $\frac{6}{7}$ of 49

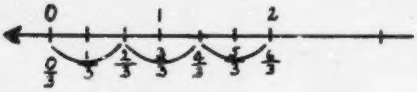
$\frac{3}{7}$ of 14 _____ $\frac{2}{7}$ of 21

Using the Number Line

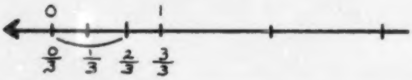
Use the number line to show that your answer is correct.

The first one has been done for you.

$\frac{1}{3}$ of 2 = ______


0
1
2
$\frac{0}{3}$
$\frac{1}{3}$
$\frac{2}{3}$
$\frac{3}{3}$
$\frac{4}{3}$
$\frac{5}{3}$
$\frac{6}{3}$

$\frac{2}{3}$ of 1 = ______


0
1
$\frac{0}{3}$
$\frac{1}{3}$
$\frac{2}{3}$
$\frac{3}{3}$

$\frac{1}{5}$ of 3 = ______

$\frac{3}{5}$ of 1 = ______

$\frac{1}{7}$ of 2 = ______

$\frac{2}{7}$ of 1 = ______

$\frac{1}{8}$ of 3 = ______

$\frac{3}{8}$ of 1 = ______

$\frac{1}{6}$ of 2 = ______

$\frac{2}{6}$ of 1 = ______

Finding Quotients

The first example has been done for you.

$9 + \frac{1}{3}$ 3) 28 27 | 9 1 | 9	2) 17
5) 26	4) 21
3) 19	5) 31
4) 29	3) 16

Finding Quotients

The first example has been done for you.

$22 \div 5 = \underline{4 + \frac{2}{5}}$

$$\begin{array}{r|l} 5)\ 22 & \\ 20 & 4 \\ \hline 2 & 4 \end{array}$$

$32 \div 6 =$ ______

$30 \div 7 =$ ______

$37 \div 5 =$ ______

$45 \div 7 =$ ______

$38 \div 9 =$ ______

$29 \div 5 =$ ______

$43 \div 8 =$ ______

Finding Quotients

The first example has been worked for you.

$\frac{27}{5} = \underline{5 + \frac{2}{5}}$ $\begin{array}{r} 5\overline{)\,27} \\ \underline{25} \\ 2 \end{array} \quad \begin{array}{c} \underline{5} \\ 5 \end{array}$	$\frac{52}{7} =$ ______
$\frac{75}{8} =$ ______	$\frac{59}{6} =$ ______
$\frac{35}{4} =$ ______	$\frac{89}{9} =$ ______
$\frac{66}{8} =$ ______	$\frac{45}{8} =$ ______

Solving Problems

Write the equation that will help you solve the problem.

Write the sentence that tells the solution to the problem.

1. The 21 children on the playground decided to play a team game. It took 6 children for each team. How many teams could they make with the 21 children?

____

____

2. Judy and 3 of her friends were playing house in the back yard. Judy's mother brought a plate of cookies for the girls to eat. Judy wanted each girl to have the same number of cookies. There were 10 cookies on the plate. How many cookies did each girl get?

____

____

3. Mrs. White had 23 tulip bulbs to plant. She planted the same number of bulbs in each of three rows. How many bulbs did she plant in each row?

____

____

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